UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended March 31, 2015

☐ **TRANSITION REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission file number 000-21898

ARROWHEAD RESEARCH CORPORATION

(Exact name of registrant as specified in its charter)

Delaware	**46-0408024**
(State of incorporation)	**(I.R.S. Employer Identification No.)**

225 S. Lake Avenue, Suite 1050
Pasadena, California 91101
(626) 304-3400
(Address and telephone number of principal executive offices)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of “large accelerated filer,” “accelerated filer” and “smaller reporting company” in Rule 12b-2 of the Exchange Act.

Large accelerated	☒	Accelerated filer	☐
Non-accelerated filer	☐ (Do not check if a smaller reporting company)	Smaller reporting company	☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The number of shares of the registrant’s common stock outstanding as of May 8, 2015 was 59,498,362.

PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

Arrowhead Research Corporation
Consolidated Balance Sheets

	(unaudited) March 31, 2015	September 30, 2014
ASSETS		
CURRENT ASSETS		
Cash and cash equivalents	$ 96,447,301	$ 132,510,610
Prepaid expenses	3,811,096	588,626
Other current assets	327,384	48,502
Short term investments	19,561,172	21,653,032
TOTAL CURRENT ASSETS	120,146,953	154,800,770
Property and equipment, net	4,127,366	3,872,753
Intangible assets, net	25,701,657	1,013,473
Investments	12,361,068	23,088,346
Other assets	41,414	41,414
TOTAL ASSETS	**$ 162,378,458**	**$ 182,816,756**
LIABILITIES AND STOCKHOLDERS' EQUITY		
CURRENT LIABILITIES		
Accounts payable	$ 4,936,282	$ 2,579,478
Accrued expenses	2,041,174	1,399,486
Due to Novartis	3,000,000	-
Accrued payroll and benefits	1,272,001	3,268,506
Deferred revenue	65,625	103,125
Derivative liabilities	1,619,755	4,173,943
Capital lease obligation	215,762	213,991
Notes payable	-	50,000
Other current liabilities	59,762	58,495
TOTAL CURRENT LIABILITIES	13,210,361	11,847,024
LONG-TERM LIABILITIES		
Capital lease obligation, net of current portion	650,014	758,340
Contingent consideration obligations	3,970,931	3,970,931
Other non-current liabilities	350,798	255,206
TOTAL LONG-TERM LIABILITIES	4,971,743	4,984,477
Commitments and contingencies		
STOCKHOLDERS' EQUITY		
Arrowhead Research Corporation stockholders' equity:		
Preferred stock, $0.001 par value; 5,000,000 shares authorized; 15,652 and 18,300 shares issued and outstanding as of March 31, 2015 and September 30, 2014, respectively	16	18
Common stock, $0.001 par value; 145,000,000 shares authorized; 59,435,862 and 54,656,936 shares issued and outstanding as of March 31, 2015 and September 30, 2014, respectively	151,805	147,026
Additional paid-in capital	420,696,539	391,164,558
Accumulated other comprehensive income (loss)	(63,965)	-
Accumulated deficit	(276,032,853)	(224,771,159)
Total Arrowhead Research Corporation stockholders' equity	144,751,542	166,540,443
Noncontrolling interest	(555,188)	(555,188)
TOTAL STOCKHOLDERS' EQUITY	144,196,354	165,985,255
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	**$ 162,378,458**	**$ 182,816,756**

The accompanying notes are an integral part of these unaudited consolidated financial statements.

Arrowhead Research Corporation
Consolidated Statements of Operations
(unaudited)

	Three Months ended March 31, 2015	Three Months ended March 31, 2014	Six Months ended March 31, 2015	Six Months ended March 31, 2014
REVENUE	**$ 43,750**	**$ 43,750**	**$ 214,500**	**$ 87,500**
OPERATING EXPENSES				
Research and development	11,640,794	5,216,446	29,387,524	8,349,460
Acquired in-process research and development	10,142,786	-	10,142,786	-
Salaries and payroll-related costs	3,541,652	3,097,902	6,692,268	5,179,693
General and administrative expenses	1,696,623	1,347,677	3,782,826	2,261,461
Stock-based compensation	2,205,079	1,198,444	4,219,935	1,719,582
Depreciation and amortization	449,559	395,779	739,598	799,184
TOTAL OPERATING EXPENSES	**29,676,493**	**11,256,248**	**54,964,937**	**18,309,380**
OPERATING LOSS	(29,632,743)	(11,212,498)	(54,750,437)	(18,221,880)
OTHER INCOME (EXPENSE)				
Equity in income (loss) of unconsolidated affiliates	-	(9,597)	-	(148,053)
Gain (loss) on sale of fixed assets, net	45,576	(5,316)	19,195	(58,878)
Interest income (expense), net	198,113	119,390	435,530	159,968
Change in value of derivatives	168,974	(2,951,225)	2,551,116	(6,470,803)
Other income (expense)	536,087	76,546	482,902	71,215
TOTAL OTHER INCOME (EXPENSE)	**948,750**	**(2,770,202)**	**3,488,743**	**(6,446,551)**
LOSS BEFORE INCOME TAXES	**(28,683,993)**	**(13,982,700)**	**(51,261,694)**	**(24,668,431)**
Provision for income taxes	-	-	-	-
NET LOSS	**(28,683,993)**	**(13,982,700)**	**(51,261,694)**	**(24,668,431)**
Net loss attributable to noncontrolling interests	-	40,179	-	97,600
NET LOSS ATTRIBUTABLE TO ARROWHEAD	**$ (28,683,993)**	**$ (13,942,521)**	**$ (51,261,694)**	**$ (24,570,831)**
NET LOSS PER SHARE ATTRIBUTABLE TO ARROWHEAD SHAREHOLDERS - BASIC & DILUTED:	$ (0.51)	$ (0.31)	$ (0.93)	$ (0.60)
Weighted average shares outstanding - basic and diluted	55,719,923	44,321,847	55,200,512	40,941,903
OTHER COMPREHENSIVE INCOME (LOSS), NET OF TAX				
Foreign Currency Translation Adjustments	(63,965)	-	(63,965)	-
COMPREHENSIVE LOSS ATTRIBUTABLE TO ARROWHEAD	**$ (28,747,958)**	**$ (13,942,521)**	**$ (51,325,659)**	**$ (24,570,831)**

The accompanying notes are an integral part of these unaudited consolidated financial statements.

Arrowhead Research Corporation
Consolidated Statement of Stockholders' Equity
(unaudited)

	Preferred Stock		Common Stock						
	Shares	Amount ($)	Shares	Amount ($)	Additional Paid-In Capital	Accumulated Other Comprehensive Income (loss)	Accumulated Deficit	Non-controlling Interest	Totals
Balance at September 30, 2013	**9,900**	**$ 10**	**32,489,444**	**$ 124,859**	**$ 193,514,766**	**$ -**	**$ (166,140,969)**	**$ (1,763,877)**	**$ 25,734,789**
Exercise of warrants	-	-	2,911,919	2,911	10,145,133	-	-	-	10,148,044
Exercise of stock options	-	-	454,863	455	2,729,545	-	-	-	2,730,000
Stock-based compensation	-	-	-	-	5,696,173	-	-	-	5,696,173
Common stock issued @ $5.86	-	-	3,071,672	3,072	14,057,040	-	-	-	14,060,112
Common stock issued @ $18.95	-	-	6,325,000	6,325	112,575,234	-	-	-	112,581,559
Preferred stock issued @ $1,000 per share	46,000	46	-	-	45,999,954	-	-	-	46,000,000
Common stock issued to Galloway	-	-	131,579	132	499,868	-	-	-	500,000
Settlements related to derivative liability	-	-	-	-	5,956,079	-	-	-	5,956,079
Preferred stock converted to common stock	(37,600)	(38)	9,272,459	9,272	(9,234)	-	-	-	-
Deconsolidation of Calando Pharmaceuticals, Inc.	-	-	-	-	-	-	-	1,303,911	1,303,911
Net loss for the year ended September 30, 2014	-	-	-	-	-	-	(58,630,190)	(95,222)	(58,725,412)
Balance at September 30, 2014	**18,300**	**$ 18**	**54,656,936**	**$ 147,026**	**$ 391,164,558**	**$ -**	**$ (224,771,159)**	**$ (555,188)**	**$ 165,985,255**
Exercise of warrants	-	-	53,578	54	270,571	-	-	-	270,625
Exercise of stock options	-	-	17,500	18	43,108	-	-	-	43,126
Stock-based compensation	-	-	-	-	4,219,935	-	-	-	4,219,935
Exercise of exchange rights	-	-	5,250	5	3,067	-	-	-	3,072
Preferred stock converted to common stock	(2,648)	(2)	1,316,215	1,316	(1,314)	-	-	-	-
Common stock-RSU vesting	-	-	65,000	65	(65)	-	-	-	-
Common stock issued to Novartis @ $7.53	-	-	3,321,383	3,321	24,996,679	-	-	-	25,000,000
Foreign currency translation adjustments	-	-	-	-	-	(63,965)	-	-	(63,965)
Net loss for the six months ended March 31, 2015	-	-	-	-	-	-	(51,261,694)	-	(51,261,694)
Balance at March 31, 2015	**15,652**	**$ 16**	**59,435,862**	**$ 151,805**	**$ 420,696,539**	**$ (63,965)**	**$ (276,032,853)**	**$ (555,188)**	**$ 144,196,354**

The accompanying notes are an integral part of these unaudited consolidated financial statements.

Arrowhead Research Corporation
Consolidated Statements of Cash Flows
(unaudited)

	Six months ended March 31, 2015	Six months ended March 31, 2014
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	$ (51,261,694)	$ (24,668,431)
Net loss attributable to non-controlling interests	-	97,600
Net loss attributable to Arrowhead	(51,261,694)	(24,570,831)
(Gain) loss on disposal of fixed assets	(19,195)	58,878
Change in value of derivatives	(2,551,116)	6,470,803
Acquired in-process research and development	10,142,786	-
Stock-based compensation	4,219,935	1,719,582
Depreciation and amortization	739,598	799,184
Amortization of note premiums	668,364	269,313
Non-controlling interest	-	(97,600)
Changes in operating assets and liabilities:		
Receivables	-	75,000
Other receivables	(279,500)	(611,360)
Other current assets	(3,223,118)	(206,011)
Accounts payable	2,402,381	1,311,947
Accrued expenses	(1,442,450)	275,370
Other	34,425	(214,329)
NET CASH USED IN OPERATING ACTIVITIES	(40,569,584)	(14,720,054)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Cash paid for acquisitions	(7,000,000)	-
Purchases of property and equipment	(852,063)	(607,772)
Proceeds from sale of fixed assets	500	-
Purchase of marketable securities	-	(46,365,528)
Proceeds from sale of marketable securities	12,150,774	5,010,238
NET CASH USED IN INVESTING ACTIVITIES	4,299,211	(41,963,062)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Principal payments on capital leases and notes payable	(106,554)	(204,448)
Proceeds from issuance of common stock and preferred stock, net	-	172,641,671
Proceeds from the exercise of warrants and stock options	313,618	7,979,309
NET CASH PROVIDED BY FINANCING ACTIVITIES	207,064	180,416,532
NET INCREASE (DECREASE) IN CASH	(36,063,309)	123,733,416
CASH AT BEGINNING OF PERIOD	132,510,610	19,114,444
CASH AT END OF PERIOD	$ 96,447,301	$ 142,847,860
Supplementary disclosures:		
Interest paid	$ 7,655	$ 17,105
Common stock issued to Novartis for asset acquisition	$ 25,000,000	$ -

The accompanying notes are an integral part of these unaudited consolidated financial statements.

Unless otherwise noted, (1) the term "Arrowhead" refers to Arrowhead Research Corporation, a Delaware corporation, (2) the terms the "Company," "we," "us," and "our," refer to the ongoing business operations of Arrowhead and its Subsidiaries, whether conducted through Arrowhead or a subsidiary of Arrowhead, (3) the term "Subsidiaries" refers collectively to Arrowhead Madison Inc. ("Madison"), Arrowhead Australia Pty Ltd ("Arrowhead Australia") and Ablaris Therapeutics, Inc. ("Ablaris"), (4) the term "Common Stock" refers to Arrowhead's Common Stock, (5) the term "Preferred Stock" refers to Arrowhead's Preferred Stock and the term "Stockholder(s)" refers to the holders of Arrowhead Common Stock.

NOTE 1. *ORGANIZATION AND SIGNIFICANT ACCOUNTING POLICIES*

Nature of Business

Arrowhead Research Corporation develops novel drugs to treat intractable diseases by silencing the genes that cause them. Using the broadest portfolio of RNA chemistries and efficient modes of delivery, Arrowhead therapies trigger the RNA interference mechanism to induce rapid, deep and durable knockdown of target genes. Arrowhead's most advanced drug candidate in clinical development is ARC-520, which is designed to treat chronic hepatitis B infection by inhibiting the production of all HBV gene products. The goal is to reverse the immune suppression that prevents the body from controlling the virus and clearing the disease. Arrowhead's second clinical candidate is ARC-AAT, a treatment for a rare liver disease associated with a genetic disorder that causes alpha-1 antitrypsin deficiency.

Liquidity

Historically, the Company's primary source of financing has been through the sale of securities of Arrowhead. Research and development activities have required significant capital investment since the Company's inception. We expect our operations to continue to require cash investment as the Company pursues its research and development goals, as well as clinical trials and related drug manufacturing. Based upon the Company's current cash resources and operating plan, the Company expects to have sufficient liquidity to fund operations for at least the next twelve months.

At March 31, 2015, the Company had $96.4 million in cash to fund operations. In addition to its cash resources, the Company has invested excess cash in investment grade commercial bonds maturing in less than 24 months. These bonds provide a source of liquidity, though the Company plans to hold them until maturity. At March 31, 2015, the Company had invested $31.9 million in bonds. During the six months ended March 31, 2015, the Company's cash position decreased by $36.1 million which was primarily the result of cash outflows related to operating activities of $40.6 million, cash paid for the acquisition of certain RNAi assets from Novartis Institutes for Biomedical Research Inc. of $7.0 million (see footnote 2) and capital expenditures of $0.9 million, partially offset by maturities of fixed income investments totaling $12.2 million and proceeds from the exercise of warrants and options of $0.3 million.

Summary of Significant Accounting Policies

Principles of Consolidation—The consolidated financial statements include the accounts of Arrowhead and its Subsidiaries. Arrowhead's primary operating subsidiary is Arrowhead Madison, which is located in Madison, Wisconsin, where the Company's research and development facility is located. All significant intercompany accounts and transactions are eliminated in consolidation.

Basis of Presentation and Use of Estimates—The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. In the opinion of management, all adjustments, consisting of normal recurring accruals, considered necessary for a fair presentation have been included. Actual results could materially differ from those estimates. Additionally, certain reclassifications have been made to prior period financial statements to conform to the current period presentation.

Cash and Cash Equivalents—The Company considers all liquid debt instruments purchased with a maturity of three months or less to be cash equivalents. The Company had no restricted cash at March 31, 2015 and September 30, 2014.

Concentration of Credit Risk—The Company maintains several bank accounts for its operations at two financial institutions. These accounts are insured by the Federal Deposit Insurance Corporation (FDIC) for up to $250,000 per account. Management believes the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which these deposits are held.

Investments—The Company may invest excess cash balances in short-term and long-term marketable debt securities. Investments may consist of certificates of deposits, money market accounts, government-sponsored enterprise securities, corporate bonds and/or commercial paper. The Company accounts for its investment in marketable securities in accordance with FASB ASC 320, Investments – Debt and Equity Securities. This statement requires certain securities to be classified into three categories:

Held-to-maturity—Debt securities that the entity has the positive intent and ability to hold to maturity are reported at amortized cost.

Trading Securities—Debt and equity securities that are bought and held primarily for the purpose of selling in the near term are reported at fair value, with unrealized gains and losses included in earnings.

Available-for-Sale—Debt and equity securities not classified as either securities held-to-maturity or trading securities are reported at fair value with unrealized gains or losses excluded from earnings and reported as a separate component of shareholders' equity.

The Company classifies its investments in marketable debt securities based on the facts and circumstances present at the time of purchase of the securities. At March 31, 2015, the Company classified all of its investments as held-to-maturity.

Held-to-maturity investments are measured and recorded at amortized cost on the Company's Consolidated Balance Sheet. Discounts and premiums to par value of the debt securities are amortized to interest income/expense over the term of the security. No gains or losses on investment securities are realized until they are sold or a decline in fair value is determined to be other-than-temporary.

Property and Equipment—Property and equipment are recorded at cost, which may equal fair market value in the case of property and equipment acquired in conjunction with a business acquisition. Depreciation of property and equipment is recorded using the straight-line method over the respective useful lives of the assets ranging from three to seven years. Leasehold improvements are amortized over the lesser of the expected useful life or the remaining lease term. Long-lived assets, including property and equipment are reviewed for impairment whenever events or circumstances indicate that the carrying amount of these assets may not be recoverable.

Intangible Assets Subject to Amortization—At March 31, 2015, intangible assets subject to amortization include certain patents and license agreements. Intangible assets subject to amortization are reviewed for impairment whenever events or circumstances indicate that the carrying amount of these assets may not be recoverable.

In-Process Research & Development (IPR&D)—IPR&D assets represent capitalized on-going research projects that were acquired through business combinations. Such assets are initially measured at their acquisition date fair values. The amounts capitalized are being accounted for as indefinite-lived intangible assets, subject to impairment testing until completion or abandonment of R&D efforts associated with the project. Upon successful completion of a project, Arrowhead will make a determination as to the then remaining useful life of the intangible asset and begin amortization. Arrowhead tests its indefinite-lived assets for impairment at least annually, through a two-step process. The first step is a qualitative assessment to determine if it is more likely than not that the indefinite lived assets are impaired. Arrowhead considers relevant events and circumstances that could affect the inputs used to determine the fair value of the intangible assets. If the qualitative assessment indicates that it is more likely than not that the intangible assets are impaired, a second step is performed which is a quantitative test to determine the fair value of the intangible asset. If the carrying amount of the intangible assets exceeds its fair value, an impairment loss is recorded in the amount of that excess. If circumstances determine that it is appropriate, the Company may also elect to bypass step one, and proceed directly to the second step.

Contingent Consideration - The consideration for the Company's acquisitions often includes future payments that are contingent upon the occurrence of a particular event. For example, milestone payments might be based on the achievement of various regulatory approvals or future sales milestones, and royalty payments might be based on drug product sales levels. The Company records a contingent consideration obligation for such contingent payments at fair value on the acquisition date. The Company estimates the fair value of contingent consideration obligations through valuation models designed to estimate the probability of such contingent payments based on various assumptions and incorporating estimated success rates. Estimated payments are discounted using present value techniques to arrive at estimated fair value at the balance sheet date. Changes in the fair value of our contingent consideration obligations are recognized within the Company's Consolidated Statements of Operations. Changes in the fair value of the contingent consideration obligations can result from changes to one or multiple inputs, including adjustments to the discount rates, changes in the amount or timing of expected expenditures associated with product development, changes in the amount or timing of cash flows from products upon commercialization, changes in the assumed achievement or timing of any development milestones, changes in the probability of certain clinical events and changes in the assumed probability associated with regulatory approval. These fair value measurements are based on significant inputs not observable in the market. Substantial judgment is employed in determining the appropriateness of these assumptions as of the acquisition date and for each subsequent period. Accordingly, changes in assumptions could have a material impact on the amount of contingent consideration expense the Company records in any given period.

Revenue Recognition—Revenue from license fees are recorded when persuasive evidence of an arrangement exists, title has passed or services have been rendered, a price is fixed and determinable, and collection is reasonably assured. The Company may generate revenue from product sales, technology licenses, collaborative research and development arrangements, and research grants. Revenue under technology licenses and collaborative agreements typically consists of nonrefundable and/or guaranteed technology license fees, collaborative research funding and various milestone and future product royalty or profit-sharing payments.

Payments under collaborative research and development agreements are recognized as revenue ratably over the relevant periods specified in the agreement, generally the period during which research and development is conducted. Revenue from up-front license fees, milestones and product royalties are recognized as earned based on the completion of the milestones and product sales, as defined in the respective agreements. Payments received in advance of recognition as revenue are recorded as deferred revenue.

Allowance for Doubtful Accounts—The Company accrues an allowance for doubtful accounts based on estimates of uncollectible revenues by analyzing historical collections, accounts receivable aging and other factors. Accounts receivable are written off when all collection attempts have failed.

Research and Development—Costs and expenses that can be clearly identified as research and development are charged to expense as incurred in accordance with FASB ASC 730-10. Included in research and development costs are operating costs, facilities, supplies, external services, clinical trial and manufacturing costs, overhead directly related to the Company's research and development operations, and costs to acquire technology licenses.

Earnings (Loss) per Share—Basic earnings (loss) per share is computed using the weighted-average number of common shares outstanding during the period. Diluted earnings (loss) per share are computed using the weighted-average number of common shares and dilutive potential common shares outstanding during the period. Dilutive potential common shares primarily consist of stock options and restricted stock units issued to employees and warrants to purchase Common Stock of the Company. All outstanding stock options, restricted stock units and warrants for the three and six months ended March 31, 2015 and 2014 have been excluded from the calculation of Diluted earnings (loss) per share due to their anti-dilutive effect.

Stock-Based Compensation—The Company accounts for share-based compensation arrangements in accordance with FASB ASC 718, which requires the measurement and recognition of compensation expense for all share-based payment awards to be based on estimated fair values. The Company uses the Black-Scholes option valuation model to estimate the fair value of its stock options at the date of grant. The Black-Scholes option valuation model requires the input of subjective assumptions to calculate the value of stock options. The Company uses historical data and other information to estimate the expected price volatility and the expected forfeiture rate. For performance-based stock awards, the value of the awards is measured at the grant date. Expense is recognized over the vesting period, commencing at the time the Company determines the achievement of such performance conditions is probable. This determination requires significant judgment by management.

Derivative Assets and Liabilities – The Company accounts for warrants and other derivative financial instruments as either equity or assets/liabilities based upon the characteristics and provisions of each instrument. Warrants classified as equity are recorded as additional paid-in capital on the Company's Consolidated Balance Sheet. Some of the Company's warrants were determined to be ineligible for equity classification because of provisions that may result in an adjustment to their exercise price. Warrants classified as derivative liabilities and other derivative financial instruments that require separate accounting as assets or liabilities are recorded on the Company's Consolidated Balance Sheet at their fair value on the date of issuance and are revalued on each subsequent balance sheet date until such instruments are exercised or expire, with any changes in the fair value between reporting periods recorded as other income or expense. The Company estimates the fair value of these assets/liabilities using option pricing models that are based on the individual characteristics of the warrants or instruments on the valuation date, as well as assumptions for expected volatility, expected life and risk-free interest rate.

Income Taxes—The Company accounts for income taxes under the liability method, which requires the recognition of deferred income tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. Under this method, deferred income taxes are recognized for the tax consequences in future years of differences between the tax bases of assets and liabilities and their financial reporting amounts at each period end based on enacted tax laws and statutory tax rates applicable to the periods in which the differences are expected to affect taxable income. Valuation allowances are established, when necessary, to reduce deferred income tax assets to the amount expected to be realized. The provision for income taxes, if any, represents the tax payable for the period and the change in deferred income tax assets and liabilities during the period.

NOTE 2. ***ACQUISITIONS***

On March 3, 2015, the Company entered into an Asset Purchase and Exclusive License Agreement (the "RNAi Purchase Agreement") with Novartis Institutes for BioMedical Research, Inc., a Delaware corporation ("Novartis"), pursuant to which the Company acquired Novartis' RNAi assets and rights thereunder. Pursuant to the RNAi Purchase Agreement, the Company acquired or licensed certain patents and patent applications owned or controlled by Novartis related to RNAi therapeutics, assignment of a third-party license, rights to three pre-clinical RNAi candidates, and other related assets (collectively, the "Purchased Assets"). The acquisition of the Purchased Assets closed on March 3, 2015, concurrent with execution of the RNAi Purchase Agreement (the "Closing").

In consideration for the Purchased Assets, the Company made certain payments to Novartis, including: (a) an initial payment of $10,000,000 in cash of which $7,000,000 was paid during the Company's first fiscal quarter of 2015 to secure an exclusivity period whereby the Company was able to exclusively examine the Novartis RNAi assets prior to finalizing the purchase, and the remaining $3,000,000 was paid in April, and 3,321,383 shares of the Company's common stock (the "Shares") were issued during the Company's second fiscal quarter; (b) escalating royalties in the single digits based upon annual net sales thresholds for certain RNAi products sold by the Company; and (c) milestone payments tied to the achievement of certain development and sales milestones for each target being developed by the Company.

Pursuant to the RNAi Purchase Agreement, prior to initiation of a phase 2 *Clinical Trial* for a given *RNAi* Product or *Arrowhead RNAi Product* directed to an *Initial Target*, Novartis has an exclusive right to negotiate a license under any *Intellectual Property Rights* owned or exclusively licensed to the Company to make, sell or otherwise commercially exploit such *RNAi Product* or *Arrowhead RNAi Product* (as such italicized terms are defined in the RNAi Purchase Agreement). After initiation of a phase 2 *Clinical Trial* for a given *Arrowhead RNAi Product* ("ROFN Candidiate"), Novartis shall have a right of first negotiation on the ROFN Candidate developed by the Company and its affiliates relating to the purchased assets. If the Company proposes to out-license, or enters into substantive negotiations to out-license, any ROFN Candidate, the Company must give notice of the ROFN Candidate it proposes to out-license and negotiate exclusively and in good faith with Novartis for a period of time regarding the applicable out-license.

In addition to the consideration paid by the Company at the closing of the Transaction, the Company is obligated to make certain royalty and milestone payments to Novartis upon the occurrence of certain events. For sales of any *RNAi Products* for which Novartis and the Company do not enter into a licensing arrangement, the Company will be obligated to pay royalty rates ranging in the low to mid-single digits on *Net Sales* depending upon the type of *RNAi Product* provided that the royalty rate may be reduced or offset in certain circumstances. The obligation to pay royalties on such candidates will last until the later of (i) the expiration of the last to *Valid Claim Covering* such *RNAi Product* in such country and (ii) 11 years after the first commercial sale of such *RNAi Product* (as such italicized terms are defined in the RNAi Purchase Agreement).

The Company will also be obligated to make cash payments to Novartis upon the achievement of various milestones for any *RNAi Products* for which Novartis and the Company do not enter into a licensing arrangement. These milestones include the initiation of a phase 2 and 3 clinical trials, US and other regulatory approvals, and annual sales milestones. These milestone payments could amount to the mid to upper double digit millions of dollars.

The following table summarizes the estimated fair values of the assets acquired at the date of acquisition:

Intangible assets - patents	$	21,728,334
Intangible assets – license		3,128,880
Acquired in-process research and development - Pre-Clinical Candidates		10,142,786
Total purchase consideration	$	35,000,000

The purchase consideration was composed of the following:

Cash Paid Prior to March 31, 2015	$	7,000,000
Cash Paid After March 31, 2015		3,000,000
Value of Shares Issued to Novartis during the three months ended March 31, 2015		25,000,000
Total purchase consideration	$	35,000,000

The Company accounted for this transaction as an acquisition of RNAi assets, including patents, a third-party license and in process research and development for the pre-clinical candidates. The allocation of the purchase price to each asset was determined by estimating the relative fair value of each asset acquired and applying that to the total cost of the acquisition for the Company. The Company capitalized the patents and license acquired as Intangible Assets as they require no future development and will have alternative future uses as the Company expands its RNAi capabilities (see footnote 5 for additional discussion of the useful lives and amortization of these Intangible Assets). The Company expensed the portion of the purchase consideration allocated to the pre-clinical candidates as they will require future development in order to be commercialized. This expense is recorded in the "Acquired in-process research and development" line item of the Consolidated Statements of Operations.

NOTE 3. ***PROPERTY AND EQUIPMENT***

The following table summarizes our major classes of property and equipment:

	March 31, 2015	September 30, 2014
Computers, office equipment and furniture	$ 372,401	$ 334,162
Research equipment	5,284,178	4,614,176
Software	94,848	69,623
Leasehold improvements	3,117,537	3,045,022
Total gross fixed assets	8,868,964	8,062,983
Less: Accumulated depreciation and amortization	(4,741,598)	(4,190,230)
Property and equipment, net	**$** 4,127,366	**$** 3,872,753

NOTE 4. ***INVESTMENTS***

The Company invests a portion of its excess cash balances in short-term and long-term debt securities. Investments at March 31, 2015 consisted of corporate bonds with maturities remaining of less than two years. The Company may also invest excess cash balances in certificates of deposit, money market accounts, US Treasuries, US government agency obligations, corporate debt securities, and/or commercial paper. The Company accounts for its investments in accordance with FASB ASC 320, Investments – Debt and Equity Securities. At March 31, 2015, all investments were classified as held-to-maturity securities.

The following tables summarize the Company's short- and long-term investments as of March 31, 2015, and September 30, 2014.

	As of March 31, 2015			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Commercial notes (due within one year)	$ 19,561,172	$ 784	$ (285,310)	$ 19,276,646
Commercial notes (due after one year through two years)	$ 12,361,068	—	$ (127,628)	$ 12,233,440
Total	$ 31,922,240	$ 784	$ (412,938)	$ 31,510,086

	As of September 30, 2014			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Commercial notes (due within one year)	$ 21,653,032	$ —	$ (189,830)	$ 21,463,202
Commercial notes (due after one year through two years)	$ 23,088,346	—	$ (217,693)	$ 22,870,653
Total	$ 44,741,378	$ —	$ (407,523)	$ 44,333,855

NOTE 5. ***INTANGIBLE ASSETS***

Intangible assets consist of in-process research and development ("IPR&D") not subject to amortization, and patents and license agreements subject to amortization, which were capitalized as a part of an asset acquisition or business combination.

IPR&D represents projects that have not yet received regulatory approval and are required to be classified as indefinite assets until the successful completion or the abandonment of the associated R&D efforts. Accordingly, during the development period after the date of acquisition, these assets will not be amortized until approval is obtained in one or more jurisdictions which, individually or combined, are expected to generate a significant portion of the total revenue expected to be earned by an IPR&D project. At that time, the Company will determine the useful life of the asset, reclassify the asset out of IPR&D and begin amortization. If the associated R&D effort is abandoned the related IPR&D assets will likely be written off and the Company would record an impairment loss. Intangible assets not subject to amortization include IPR&D capitalized as part of a business combination from the acquisition of Roche Madison.

Intangible assets subject to amortization include patents and a license agreement capitalized as part of the Novartis RNAi asset acquisition and a business combination from the acquisition of Roche Madison. The license agreement associated with the Novartis RNAi asset acquisition is being amortized over the estimated life remaining at the time of acquisition which was 21 years, and the accumulated amortization of the asset is approximately $12,367. The license agreements associated with the acquisition of Roche Madison are being amortized over the estimated life remaining at the time of acquisition, which was 4 years, and the accumulated amortization of the assets is approximately $188,790. The patents associated with the Novartis RNAi asset acquisition are being amortized over the estimated life remaining at the time of acquisition which was 14 years, and the accumulated amortization of the assets is approximately $129,335. Amortization expense for the three and six months ended March 31, 2015 was $155,366 and $169,030, respectively. Amortization expense for the three and six months ended March 31, 2014 was $13,663 and $27,327, respectively. Amortization expense is expected to be approximately $877,541 for the remainder of fiscal year 2015, $1,714,313 in 2016, $1,700,429 in 2017, $1,700,429 in 2018, $1,700,429 in 2019, $1,700,429 in 2020, and $15,363,152 thereafter.

The following table provides details on the Company's intangible asset balances:

	Intangible assets not subject to amortization	Intangible assets subject to amortization	Total Intangible assets
Balance at September 30, 2013	$ 3,117,322	$ 123,191	$ 3,240,513
Impairment	(2,172,387)	-	(2,172,387)
Amortization	-	(54,653)	(54,653)
Balance at September 30, 2014	$ 944,935	$ 68,538	$ 1,013,473
Acquisition of Novartis RNAi Assets	-	24,857,214	24,857,214
Amortization	-	(169,030)	(169,030)
Balance at March 31, 2015	$ 944,935	$ 24,756,722	$ 25,701,657

NOTE 6. *STOCKHOLDERS' EQUITY*

At March 31, 2015, the Company had a total of 150,000,000 shares of capital stock authorized for issuance, consisting of 145,000,000 shares of Common Stock, par value $0.001 per share, and 5,000,000 shares of Preferred Stock, par value $0.001 per share.

At March 31, 2015, 59,435,862 shares of Common Stock were outstanding. Additionally, 15,652 shares of Series C Preferred Stock were outstanding, which are convertible into 2,670,990 shares of Common Stock. At March 31, 2015, 8,192,654 shares of Common Stock were reserved for issuance upon exercise of options and vesting of restricted stock units granted or available for grant under Arrowhead's 2004 Equity Incentive Plan and 2013 Incentive Plan, as well as for inducement grants made to new employees.

The Preferred Stock is convertible to Common Stock by its holder at its stated conversion price, though it is not convertible to the extent the holder would beneficially own more than 9.99% of the number of shares of outstanding Common Stock immediately after the conversion. The holders of Preferred Stock are eligible to vote with the Common Stock of the Company on an as-converted basis, but only to the extent they are eligible for conversion without exceeding the 9.99% ownership limitation. The Preferred Stock does not carry a coupon, but it is entitled to receive dividends on a pari passu basis with Common Stock, when and if declared. In any liquidation or dissolution of the Company, the holders of Preferred Stock are entitled to participate in the distribution of the assets, to the extent legally available for distribution, on a pari passu basis with the Common Stock.

On October 11, 2013, the Company sold 3,071,672 shares of Common Stock, at a price of $5.86 per share, and 46,000 shares of Series C Preferred Stock, at a price of $1,000 per share. The Preferred Shares are convertible into shares of common stock at a conversion price of $5.86. The aggregate purchase price paid by the purchasers for the Common Stock and Series C Preferred Stock was $64,000,000 and the Company received net proceeds of approximately $60,000,000, after advisory fees and offering expenses.

On February 24, 2014, the Company sold 6,325,000 shares of Common Stock, at a public offering price of $18.95 per share. Net proceeds were approximately $112.6 million after underwriting commissions and discounts and other offering expenses.

The following table summarizes information about warrants outstanding at March 31, 2015:

Exercise prices	Number of Warrants	Remaining Life in Years
$ 70.60	94,897	2.1
$ 5.00	390,625	0.5
$ 5.09	239,534	0.2
$ 1.38	24,324	0.7
$ 4.16	1,000	1.7
$ 3.25	334,347	1.4
$ 2.12	75,000	2.7
$ 1.83	277,284	2.7
Total warrants outstanding	1,437,011	

NOTE 7. *COMMITMENTS AND CONTINGENCIES*

Leases

The Company leases office space for its corporate headquarters in Pasadena, California. In March 2014, the Company signed a lease addendum to expand its corporate headquarters, and the new space became available in September 2014. The leases for the expansion space and the current space will expire in September 2019. Rental costs, including the expansion space, are approximately $23,000 per month, increasing approximately 3% annually.

The Company's research facility in Madison, Wisconsin is leased through February 28, 2019. Monthly rental expense is approximately $26,000. Other monthly rental expenses include common area maintenance and real estate taxes totaling approximately $18,000 per month. Utilities costs are approximately $16,000 per month. Total monthly costs are approximately $79,000 per month, including monthly payments recorded under a capital lease of approximately $19,000.

Facility rent expense for the three and six months ended March 31, 2015 was $191,000 and $362,000, respectively. Facility rent expense for the three and six months ended March 31, 2014 was $134,000 and $264,000, respectively.

As of March 31, 2015, future minimum lease payments due in fiscal years under capitalized leases are as follows:

2015 (remainder of)	$ 114,210
2016	228,420
2017	228,420
2018	228,420
2019	95,178
2020 and thereafter	-
Less interest	(28,872)
Principal	865,776
Less current portion	(215,762)
Noncurrent portion	$ 650,014

As of March 31, 2015, future minimum lease payments due in fiscal years under operating leases are as follows:

2015 (remainder of)	$ 292,119
2016	596,877
2017	613,664
2018	637,897
2019	459,633
2020 and thereafter	-
Total	$ 2,600,190

Litigation

The Company, its Chief Executive Officer and its Chief Operating Officer have been named as defendants in two securities class actions filed in the United States District Court for the Central District of California regarding certain public statements in connection with the Company's hepatitis B drug research. Both actions assert claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 and seek damages in an unspecified amount. Two actions with similar claims under California State law are currently pending in Los Angeles Superior Court. Additionally, three putative stockholder derivative actions have been filed in the United States District Court for the Central District of California, alleging breach of fiduciary duty by the Company's Board of Directors in connection with the facts underlying the Securities Claims. Each of these seven suits seeks damages in unspecified amounts and some seek various forms of injunctive relief.

The Company and two of its former executives have been named as defendants in a complaint filed by William Marsh Rice University ("Rice University") currently pending in the United States District Court for the Southern District of Texas relating to alleged breaches of a license agreement between Rice University and the Company's former subsidiary, Unidym, Inc. The plaintiff has alleged that the Company and its former executives acted fraudulently with respect to Unidym's license from Rice University and seeks injunctive relief, damages, including unspecified compensatory and punitive damages, and attorneys' fees.

The Company believes it has meritorious defenses and intends to vigorously defend itself in each of the above matters. The Company makes provisions for liabilities when it is both probable that a liability has been incurred and the amount can be reasonably estimated. No such liability has been recorded related to these matters. The Company does not expect these matters to have any material effect on its Consolidated Financial Statements. With regard to legal fees, such as attorney fees related to these matters or any other legal matters, the Company's accounting policy is to recognize such cost as incurred.

Purchase Commitments

In the normal course of business, we enter into various purchase commitments for the manufacture of drug components, toxicology studies, and for clinical studies. As of March 31, 2015, these future commitments were approximately $49.7 million, of which approximately $29.5 million is expected to be incurred in the remainder of fiscal 2015, and $20.2 million is expected to be incurred beyond fiscal 2015.

Technology License Commitments

The Company has licensed from third parties the rights to use certain technologies that it uses in its research and development activities, as well as in any products the Company may develop using these licensed technologies. These agreements and other similar agreements often require milestone and royalty payments. Milestone payments, for example, may be required as the research and development process progresses through various stages of development, such as when clinical candidates enter or progress through clinical trials, upon NDA and upon certain sales level milestones. These milestone payments could amount to the mid to upper double digit millions of dollars. In certain agreements, the Company may be required to make mid to high single digit percentage royalty payments based on a percentage of the sales of the relevant products.

NOTE 8. *STOCK-BASED COMPENSATION*

Arrowhead has two plans that provide for equity-based compensation. Under the 2004 Equity Incentive Plan and 2013 Incentive Plan, as of March 31, 2015, 2,546,018 and 5,094,314 shares, respectively, of Arrowhead's Common Stock are reserved for the grant of stock options, stock appreciation rights, restricted stock awards and performance unit/share awards by the Board of Directors to employees, consultants and others. No further grants may be made under the 2004 Equity Incentive Plan. As of March 31, 2015, there were options granted and outstanding to purchase 2,546,018 and 2,306,000 shares of Common Stock under the 2004 Equity Incentive Plan and the 2013 Incentive Plan, respectively, and there were 1,080,000 restricted stock units granted and outstanding under the 2013 Incentive Plan. Also, as of March 31, 2015, there were 547,322 shares reserved for options and 70,000 restricted stock units issued as inducement grants to new employees outside of equity compensation plans. During the three months ended March 31, 2015, no options were granted under the 2004 Equity Incentive Plan, 625,000 options and 675,000 restricted stock units were granted under the 2013 Incentive Plan, and no options and restricted stock units were granted as inducement awards to new employees outside of equity incentive plans. During the six months ended March 31, 2015, no options were granted under the 2004 Equity Incentive Plan, 1,489,000 options and 675,000 restricted stock units were granted under the 2013 Incentive Plan, and 120,000 options and 30,000 restricted stock units were granted as inducement awards to new employees outside of equity incentive plans. Additionally, the Company's 2000 Stock Option Plan and the 38,000 stock options that were outstanding under the 2000 Stock Option Plan expired during the six months ended March 31, 2015.

The following tables summarize information about stock options:

	Number of Options Outstanding	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value
Balance At September 30, 2013	3,419,285	$ 4.68		
Granted	1,039,000	14.05		
Cancelled	(152,582)	6.05		
Exercised	(454,863)	6.00		
Balance At September 30, 2014	3,850,840	6.99		
Granted	1,609,000	6.34		
Cancelled	(43,000)	17.01		
Exercised	(17,500)	2.46		
Balance At March 31, 2015	5,399,340	$ 6.73	8.3 years	$ 9,160,725
Exercisable At March 31, 2015	2,117,387	$ 5.98	7.2 years	$ 4,617,497

Stock-based compensation expense related to stock options for the three and six months ended March 31, 2015 was $1,198,891 and $2,180,290, respectively and for the three and six months ended March 31, 2014 was $627,737 and $1,148,875, respectively. The Company does not recognize an income tax benefit as the Company is currently operating at a loss and an actual income tax benefit may not be realized. For non-qualified stock options, the loss creates a timing difference, resulting in a deferred tax asset, which is fully reserved by a valuation allowance.

The fair value of the options granted by Arrowhead for the three and six months ended March 31, 2015 is estimated at $2,114,074 and $5,703,692, respectively, and for the three and six months ended March 31, 2014 was estimated at $7,085,676 and $7,617,186, respectively.

The intrinsic value of the options exercised during the three and six months ended March 31, 2015 was $89,954 and $113,728, respectively, and for the three and six months ended March 31, 2014 was $2,903,309 and $3,218,167, respectively.

As of March 31, 2015, the pre-tax compensation expense for all outstanding unvested stock options in the amount of approximately $13,982,343 will be recognized in our results of operations over a weighted average period of 3.1 years.

The fair value of each stock option award is estimated on the date of grant using the Black-Scholes option pricing model. The Black-Scholes option valuation model was developed for use in estimating the fair value of traded options, which do not have vesting restrictions and are fully transferable. The determination of the fair value of each stock option is affected by our stock price on the date of grant, as well as assumptions regarding a number of highly complex and subjective variables. Because the Company's employee stock options have characteristics significantly different from those of traded options, and because changes in the subjective input assumptions can materially affect the fair value estimate, in management's opinion, the existing models do not necessarily provide a reliable single measure of the fair value of its employee stock options.

The assumptions used to value stock options are as follows:

	Six months ended March 31,	
	2015	2014
Dividend yield	—	—
Risk-free interest rate	1.55 – 1.85%	1.9 – 2.26%
Volatility	75%	69%
Expected life (in years)	6 - 6.25	5.5 - 6.25
Weighted average grant date fair value per share of options granted	$3.54	$9.08

The dividend yield is zero as the Company currently does not pay a dividend.

The risk-free interest rate is based on the U.S. Treasury bond.

Volatility is estimated based on volatility average of the Company's Common Stock price.

Restricted Stock Units

Restricted Stock Units (RSUs) were granted under the Company's 2013 Incentive Plan and as inducement grants granted outside of the Plan. During the three and six months ended March 31, 2015, the Company issued 675,000 and 705,000 restricted stock units, respectively, to certain members of management and during the three and six months ended March 31, 2014, the Company issued 470,000 and 470,000 restricted stock units, respectively. Of the restricted stock units granted during the six months ended March 31, 2015 and 2014, 30,000 and 0, respectively, were granted outside of the Plan as an inducement grant to a new employee. At vesting each RSU will be exchanged for one share of the Company's Common Stock. Restricted stock unit awards generally vest subject to the satisfaction of service requirements or the satisfaction of both service requirements and achievement of certain performance targets.

The following table summarizes the activity of the Company's Restricted Stock Units:

	Number of RSUs	Weighted-Average Grant Date Fair Value
Unvested at September 30, 2013	—	$ —
Granted	510,000	14.58
Vested	—	—
Forfeited	—	—
Unvested at September 30, 2014	510,000	$ 14.58
Granted	705,000	6.77
Vested	(267,500)	14.54
Forfeited	—	—
Unvested at March 31, 2015	947,500	$ 8.78

The Company recorded $1,006,188 and $2,039,645 of expense relating to restricted stock units during the three and six months ended March 31, 2015, respectively, and $570,707 and $570,707 during the three and six months March 31, 2014, respectively. Such expense is included in stock-based compensation expense in the Company's Consolidated Statement of Operations.

As of March 31, 2015, the pre-tax compensation expense for all unvested restricted stock units in the amount of approximately $6,147,120 will be recognized in the Company's results of operations over a weighted average period of 1.8 years.

NOTE 9. *FAIR VALUE MEASUREMENTS*

The Company measures its financial assets and liabilities at fair value. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (i.e., exit price) in an orderly transaction between market participants at the measurement date. Additionally, the Company is required to provide disclosure and categorize assets and liabilities measured at fair value into one of three different levels depending on the assumptions (i.e., inputs) used in the valuation. Level 1 provides the most reliable measure of fair value while Level 3 generally requires significant management judgment. Financial assets and liabilities are classified in their entirety based on the lowest level of input significant to the fair value measurement. The fair value hierarchy is defined as follows:

Level 1—Valuations are based on unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2—Valuations are based on quoted prices for similar assets or liabilities in active markets, or quoted prices in markets that are not active for which significant inputs are observable, either directly or indirectly.

Level 3—Valuations are based on prices or valuation techniques that require inputs that are both unobservable and significant to the overall fair value measurement. Inputs reflect management's best estimate of what market participants would use in valuing the asset or liability at the measurement date.

The following table summarizes fair value measurements at March 31, 2015 and September 30, 2014 for assets and liabilities measured at fair value on a recurring basis:

March 31, 2015:

	Level 1	Level 2	Level 3	Total
Cash and cash equivalents	$ 96,447,301	$ —	$ —	$ 96,447,301
Derivative liabilities	$ —	$ —	$ 1,619,755	$ 1,619,755
Acquisition-related contingent consideration obligations	$ —	$ —	$ 3,970,931	$ 3,970,931

September 30, 2014:

	Level 1	Level 2	Level 3	Total
Cash and cash equivalents	$ 132,510,610	$ —	$ —	$ 132,510,610
Derivative liabilities	$ —	$ —	$ 4,173,943	$ 4,173,943
Acquisition-related contingent consideration obligations	$ —	$ —	$ 3,970,931	$ 3,970,931

The Company invests its excess cash balances in short- and long-term corporate bonds, generally with remaining maturities of less than two years. At March 31, 2015, the Company had short-term investments of $19,561,172, and long-term investments of $12,361,068, for a total of $31,922,240. The fair value of its investment at March 31, 2015 was $31,510,086. The Company expects to hold such investments until maturity, and thus unrealized gains and losses from the fluctuations in the fair value of the securities are not likely to be realized.

As part of an equity financing in June 2010, Arrowhead issued warrants to acquire up to 329,649 shares of Common Stock (the “2010 Warrants”), of which 24,324 warrants were outstanding at March 31, 2015. Similarly, as part of a financing in December 2012, Arrowhead issued warrants to acquire up to 912,543 shares of Common Stock (the “2012 Warrants”) of which 265,161 warrants were outstanding at March 31, 2015. Further, as part of a financing in January 2013, Arrowhead issued warrants to acquire up to 833,530 shares of Common Stock (the “2013 Warrants”) of which 12,123 warrants were outstanding at March 31, 2015 (collectively the “Warrants”). Each of the Warrants discussed above contains a mechanism to adjust the strike price upon the issuance of certain dilutive equity securities. If during the terms of the Warrants, the Company issues Common Stock at a price lower than the exercise price for the Warrants, the exercise price would be reduced to the amount equal to the issuance price of the Common Stock. As a result of these features, the Warrants are subject to derivative accounting as prescribed under ASC 815. Accordingly, the fair value of the Warrants on the date of issuance was estimated using an option pricing model and recorded on the Company’s Consolidated Balance Sheet as a derivative liability. The fair value of the Warrants is estimated at the end of each reporting period and the change in the fair value of the Warrants is recorded as a non-operating gain or loss as change in value of derivatives in the Company’s Consolidated Statement of Operations. During the three and six months ended March 31, 2015, the Company recorded a non-cash gain from the change in fair value of the derivative liability of $191,910 and $2,371,561, respectively. During the three and six months ended March 31, 2014, the Company recorded a non-cash loss of $2,910,116 and $6,417,612, respectively.

The assumptions used in valuing the derivative liability were as follows:

2010 Warrants	March 31, 2015	September 30, 2014
Risk-free interest rate	0.26%	0.13%
Expected life	0.7 Years	1.2 Years
Dividend yield	None	None
Volatility	75%	69%
2012 Warrants	March 31, 2015	September 30, 2014
Risk-free interest rate	0.89%	1.07%
Expected life	2.7 Years	3.2 Years
Dividend yield	None	None
Volatility	75%	69%
2013 Warrants	March 31, 2015	September 30, 2014
Risk-free interest rate	0.89%	1.07%
Expected life	2.8 Years	3.3 Years
Dividend yield	None	None
Volatility	75%	69%

The following is a reconciliation of the derivative liability related to these warrants:

Value at September 30, 2013	$	4,091,797
Issuance of instruments		—
Change in value		5,821,796
Net settlements		(5,956,079)
Value at September 30, 2014	$	3,957,514
Issuance of instruments		—
Change in value		(2,371,561)
Net settlements		—
Value at March 31, 2015	$	1,585,953

In conjunction with the financing of Ablaris in fiscal 2011, Arrowhead sold exchange rights to certain investors whereby the investors have the right to exchange their shares of Ablaris for a prescribed number of Arrowhead shares of Common Stock based upon a predefined ratio. The exchange rights have a seven-year term. During the first year, the exchange right allows the holder to exchange one Ablaris share for 0.06 Arrowhead shares. This ratio declines to 0.04 in the second year, 0.03 in the third year and 0.02 in the fourth year. In the fifth year and beyond the exchange ratio is 0.01. Exchange rights for 675,000 Ablaris shares were sold in fiscal 2011, and 500,000 remain outstanding at March 31, 2015. The exchange rights are subject to derivative accounting as prescribed under ASC 815. Accordingly, the fair value of the exchange rights on the date of issuance was estimated using an option pricing model and recorded on the Company's Consolidated Balance Sheet as a derivative liability. The fair value of the exchange rights is estimated at the end of each reporting period and the change in the fair value of the exchange rights is recorded as a non-operating gain or loss in the Company's Consolidated Statement of Operations. During the three and six months ended March 31, 2015, the Company recorded a non-cash loss and gain from the change in fair value of the derivative liability of $22,936 and $179,555, respectively. During the three and six months ended March 31, 2014, the Company recorded a non-cash loss of $41,109 and $53,191, respectively.

The assumptions used in valuing the derivative liability were as follows:

	March 31, 2015	September 30, 2014
Risk-free interest rate	1.00%	1.07%
Expected life	3.0 Years	3.3 Years
Dividend yield	None	None
Volatility	75%	100%

The following is a reconciliation of the derivative liability related to these exchange rights:

Value at September 30, 2013	$	4,569
Issuance of instruments		—
Change in value		211,860
Net settlements		—
Value at September 30, 2014	$	216,429
Issuance of instruments		—
Change in value		(179,555)
Net settlements		(3,072)
Value at March 31, 2015	$	33,802

The derivative assets/liabilities are estimated using option pricing models that are based on the individual characteristics of the warrants or instruments on the valuation date, as well as assumptions for expected volatility, expected life and risk-free interest rate. Changes in the assumptions used could have a material impact on the resulting fair value. The primary input affecting the value of our derivatives liabilities is the Company's stock price. Other inputs have a comparatively insignificant effect.

As of March 31, 2015, the Company has a liability for contingent consideration related to its acquisition of Roche Madison Inc. The fair value measurement of the contingent consideration obligations is determined using Level 3 inputs. The fair value of contingent consideration obligations is based on a discounted cash flow model using a probability-weighted income approach. The measurement is based upon unobservable inputs supported by little or no market activity based on the Company's assumptions and experience. Estimating timing to complete the development and obtain approval of products is difficult, and there are inherent uncertainties in developing a product candidate, such as obtaining U.S. Food and Drug Administration (FDA) and other regulatory approvals. In determining the probability of regulatory approval and commercial success, the Company utilizes data regarding similar milestone events from several sources, including industry studies and its own experience. These fair value measurements represent Level 3 measurements as they are based on significant inputs not observable in the market. Significant judgment is employed in determining the appropriateness of these assumptions as of the acquisition date and for each subsequent period. Accordingly, changes in assumptions could have a material impact on the amount of contingent consideration expense the Company records in any given period. Changes in the fair value of the contingent consideration obligations are recorded in the Company's Consolidated Statement of Operations.

The following is a reconciliation of contingent consideration fair value.

Value at September 30, 2013	$	1,595,273
Purchase price contingent consideration		—
Contingent consideration payments		—
Change in fair value of contingent consideration		2,375,658
Value at September 30, 2014	$	3,970,931
Purchase price contingent consideration		—
Contingent consideration payments		—
Change in fair value of contingent consideration		—
Value at March 31, 2015	$	3,970,931

The fair value of contingent consideration obligations is estimated through valuation models designed to estimate the probability of such contingent payments based on various assumptions and incorporating estimated success rates. Estimated payments are discounted using present value techniques to arrive at estimated fair value at the balance sheet date. Changes in the fair value of the contingent consideration obligations can result from changes to one or multiple inputs, including adjustments to the discount rates, changes in the amount or timing of expected expenditures associated with product development, changes in the amount or timing of cash flows from products upon commercialization, changes in the assumed achievement or timing of any development milestones, changes in the probability of certain clinical events and changes in the assumed probability associated with regulatory approval. Each of these assumptions can have a significant impact on the calculation of contingent consideration.

The carrying amounts of the Company's other financial instruments, which include accounts receivable, accounts payable, and accrued expenses approximate their respective fair values due to the relatively short-term nature of these instruments. The carrying value of the Company's debt obligations approximates fair value based on market interest rates.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This Quarterly Report on Form 10-Q contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, and we intend that such forward-looking statements be subject to the safe harbors created thereby. For this purpose, any statements contained in this Quarterly Report on Form 10-Q except for historical information may be deemed to be forward-looking statements. Without limiting the generality of the foregoing, words such as "may," "will," "expect," "believe," "anticipate," "intend," "could," "estimate," or "continue" or the negative or other variations thereof or comparable terminology are intended to identify forward-looking statements. In addition, any statements that refer to projections of our future financial performance, trends in our businesses, or other characterizations of future events or circumstances are forward-looking statements.

The forward-looking statements included herein are based on current expectations of our management based on available information and involve a number of risks and uncertainties, all of which are difficult or impossible to predict accurately and many of which are beyond our control. As such, our actual results may differ significantly from those expressed in any forward-looking statements. Readers should carefully review the factors identified in this report under the caption "Risk Factors" as well as the additional risks described in other documents we file from time to time with the Securities and Exchange Commission ("SEC"), including our most recent Annual Report on Form 10-K and subsequent quarterly reports on Form 10-Q. In light of the significant risks and uncertainties inherent in the forward-looking information included herein, the inclusion of such information should not be regarded as a representation by us or any other person that such results will be achieved, and readers are cautioned not to place undue reliance on such forward-looking information. Except as may be required by law, we disclaim any intent to revise the forward-looking statements contained herein to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events.

Overview

Arrowhead Research develops novel drugs to treat intractable diseases by silencing the genes that cause them. Using the broadest portfolio of RNA chemistries and efficient modes of delivery, Arrowhead therapies trigger the RNA interference mechanism to induce rapid, deep and durable knockdown of target genes. Arrowhead's most advanced drug candidate in clinical development is ARC-520, which is designed to treat chronic hepatitis B infection by inhibiting the production of all HBV gene products. The goal is to reverse the immune suppression that prevents the body from controlling the virus and clearing the disease. Arrowhead's second clinical candidate is ARC-AAT, a treatment for a rare liver disease associated with a genetic disorder that causes alpha-1 antitrypsin deficiency.

Arrowhead operates a lab facility in Madison, Wisconsin, where the Company's research and development activities, including the development of its RNAi therapeutics, are based. The Company's principal executive offices are located in Pasadena, California.

During the first half of fiscal year 2015, the Company continued to develop its lead clinical candidate, ARC-520, for the treatment of chronic hepatitis B as well as its second clinical candidate, ARC-AAT, an RNAi therapeutic designed to treat liver disease associated with Alpha-1 antitrypsin deficiency (AATD). The Company continues its Phase 2a studies in ARC-520, with no dose-limiting toxicities or serious adverse events having been observed to date. The Company submitted an Investigational New Drug application to the U.S. Food and Drug Administration in December 2014 for ARC-520 to initiate phase 2b multi-dose studies to determine the depth of hepatitis B surface antigen (HBsAg) reduction following ARC-520 injection. The Company received feedback from the FDA, and based on that feedback the Company adjusted the protocol in order to begin the trial. In April 2015, the application was approved by the FDA. The Company also expects to file with Asian and European agencies to begin additional phase 2b studies in fiscal year 2015. Additionally, the Company has initiated dosing in a phase 1 clinical trial for ARC-AAT following successful completion of the Clinical Trial Notification (CTN) regulatory process in Australia.

In March 2015, the Company also completed the acquisition of Novartis' entire RNAi research and development portfolio and associated assets. The acquisition included assignment of certain patents and patent applications owned or controlled by Novartis related to RNAi therapeutics, an exclusive license in the RNAi field to other patents and patent applications owned or controlled by Novartis, assignment of a third party license, three pre-clinical RNAi candidates, and other related assets. This acquisition will significantly expand the Company's RNAi capabilities as the assets are integrated.

The Company continues to develop other clinical candidates for future clinical trials, focusing on intravenously-administered therapeutics targeting gene knockdown in the liver, as well as formulations for administering RNAi-based therapeutics by subcutaneous administration. Clinical candidates are tested internally and through GLP toxicology studies at outside laboratories, and drug materials for such studies, and for clinical trials, are contracted to third-party manufactures when cGMP production is required. The Company engages third-party contract research organizations (CROs) to manage clinical trials and works cooperatively with such organizations on all aspects of clinical trial management, including plan design, patient recruiting, and follow up. These outside costs, relating to the preparation for and administration of clinical trials, are referred to as program costs, and if the clinical candidates progress through human testing, program costs will increase.

Net losses were $28.7 million and $51.3 million during the three and six months ended March 31, 2015, respectively, and $14.0 million and $24.7 million during the three and six months ended March 31, 2014, respectively. Diluted losses per share were $0.51 and $0.93 during the three and six months ended March 31, 2015, respectively, and $0.31 and $0.60 during the three and six months ended March 31, 2014, respectively.

The Company also substantially strengthened its liquidity and financial position through two securities offerings completed in October 2013 and February 2014 which generated approximately $172.6 million of cash proceeds for the Company. These cash proceeds secured the funding needed to advance both ARC-520 and ARC-AAT through future clinical trials and will also assist as the Company expands its pipeline of other clinical candidates. The Company had $96.4 million of Cash and Cash Equivalents and $162.4 million of Total Assets as of March 31, 2015 as compared to $132.5 million and $182.8 million as of September 30, 2014, respectively. The decrease in Cash and Cash Equivalents and Total Assets reflects cash outflows associated with the Company's research and development efforts for its clinical candidates and pipeline, as well as cash paid for the Novartis RNAi assets acquired. Based upon the Company's current cash resources and operating plan, the Company expects to have sufficient liquidity to fund operations for at least the next twelve months.

Critical Accounting Policies and Estimates

Management makes certain judgments and uses certain estimates and assumptions when applying accounting principles generally accepted in the United States in the preparation of our Consolidated Financial Statements. We evaluate our estimates and judgments on an ongoing basis and base our estimates on historical experience and on assumptions that we believe to be reasonable under the circumstances. Our experience and assumptions form the basis for our judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may vary from what we anticipate and different assumptions or estimates about the future could change our reported results. We believe the following accounting policies are the most critical to us, in that they are important to the portrayal of our Consolidated Financial Statements and require our most difficult, subjective or complex judgments in the preparation of our consolidated financial statements. For further information, see *Note 1, Organization and Significant Accounting Policies*, to our Consolidated Financial Statements, which outlines our application of significant accounting policies.

Revenue Recognition

Revenue from product sales are recorded when persuasive evidence of an arrangement exists, title has passed and delivery has occurred, a price is fixed and determinable, and collection is reasonably assured.

We may generate revenue from technology licenses, collaborative research and development arrangements, research grants and product sales. Revenue under technology licenses and collaborative agreements typically consists of nonrefundable and/or guaranteed technology license fees, collaborative research funding, and various milestone and future product royalty or profit-sharing payments.

Revenue associated with research and development funding payments under collaborative agreements is recognized ratably over the relevant periods specified in the agreement, generally the research and development period. Revenue from up-front license fees, milestones and product royalties are recognized as earned based on the completion of the milestones and product sales, as defined in the respective agreements. Payments received in advance of recognition as revenue are recorded as deferred revenue.

Asset Acquisition

On March 3, 2015, the Company entered into an Asset Purchase and Exclusive License Agreement (the "RNAi Purchase Agreement") with Novartis Institutes for BioMedical Research, Inc., a Delaware corporation ("Novartis"), pursuant to which the Company acquired Novartis' RNAi assets and rights thereunder. Pursuant to the Agreement, the Company acquired or licensed certain patents and patent applications owned or controlled by Novartis related to RNAi therapeutics, assignment of a third-party license, rights to three pre-clinical RNAi candidates, and other related assets (collectively, the "Purchased Assets"). The acquisition of the Purchased Assets closed on March 3, 2015, concurrent with execution of the Agreement (the "Closing").

In consideration for the Purchased Assets, the Company made certain payments to Novartis, including: (a) an initial payment of $10,000,000 in cash, of which $7,000,000 was paid during the Company's first fiscal quarter of 2015 to secure an exclusivity period whereby the Company was able to exclusively examine the Novartis RNAi assets prior to finalizing the purchase, and the remaining $3,000,000 was paid in the third fiscal quarter, and 3,321,383 shares of the Company's common stock (the "Shares") were issued during the Company's second fiscal quarter; (b) escalating royalties in the single digits based upon annual net sales thresholds for certain RNAi products sold by the Company; and (c) milestone payments tied to the achievement of certain development and sales milestones for each target being developed by the Company.

The Company accounted for this transaction as an acquisition of RNAi assets, including patents, a third-party license and in process research and development for the pre-clinical candidates. The allocation of the purchase price to each asset was determined by estimating the relative fair value of each asset acquired and applying that to the total cost of the acquisition for the Company. The Company capitalized the patents and license acquired as Intangible Assets as they require no future development and will have alternative future uses as the Company expands its RNAi capabilities. The Company expensed the portion of the purchase consideration allocated to the pre-clinical candidates as they will require future development in order to be commercialized. This expense is recorded in the "Acquired in-process research and development" line item of the Consolidated Statements of Operations.

Impairment of Long-lived Assets

We review long-lived assets for impairment whenever events or changes in business circumstances indicate that the carrying amount of assets may not be fully recoverable or that our assumptions about the useful lives of these assets are no longer appropriate. If impairment is indicated, recoverability is measured by a comparison of the carrying amount of an asset to the estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of an asset exceeds its estimated future cash flows, an impairment charge is recognized in the amount by which the carrying amount of the asset exceeds the fair value of the asset.

Impairment of Intangible assets

Intangible assets consist of patents and license agreements acquired in conjunction with asset and business acquisitions. Intangible assets are monitored for potential impairment whenever events or circumstances indicate that the carrying amount may not be recoverable, and are also reviewed annually to determine whether any impairment is necessary. Based on ASC 350, the annual review of intangible assets is performed via a two-step process. First, a qualitative assessment is performed to determine if it is more likely than not that the intangible asset is impaired. If required, a quantitative assessment is performed and, if necessary, impairment is recorded.

Stock-Based Compensation

We recognize stock-based compensation expense for stock options based on the grant date fair value using the Black-Scholes options pricing model, which requires us to make assumptions regarding certain variables including the risk-free interest rate, expected stock price volatility, assumed forfeitures, and the expected life of the award. The grant date fair value of restricted stock units granted is based upon the quoted closing market price per share on the date of grant, adjusted for assumed forfeitures. Expense for stock options and restricted stock units is recognized over the requisite service period. The assumptions used in calculating stock-based compensation expense represent management's best estimates, but these estimates involve inherent uncertainties, and if factors change or the Company used different assumptions, its stock-based compensation expense could be materially different in the future.

Derivative Assets and Liabilities

We account for warrants and other derivative financial instruments as either equity or assets/liabilities based upon the characteristics and provisions of each instrument. Warrants classified as equity are recorded as additional paid-in capital on our Consolidated Balance Sheet and no further adjustments to their valuation are made. Some of our warrants were determined to be ineligible for equity classification because of provisions that may result in an adjustment to their exercise price. Warrants classified as derivative liabilities and other derivative financial instruments that require separate accounting as assets or liabilities are recorded on our Consolidated Balance Sheet at their fair value on the date of issuance and are revalued on each subsequent balance sheet date until such instruments are exercised or expire, with any changes in the fair value between reporting periods recorded as other income or expense. We estimate the fair value of these assets/liabilities using option pricing models that are based on the individual characteristics of the warrants or instruments on the valuation date, as well as assumptions for expected volatility, expected life and risk-free interest rate. Changes in the assumptions used could have a material impact on the resulting fair value. The primary input affecting the value of our derivatives liabilities is the Company's stock price.

Contingent Consideration

The consideration for our acquisitions often includes future payments that are contingent upon the occurrence of a particular event. For example, milestone payments might be based on the achievement of various regulatory approvals or future sales milestones, and royalty payments might be based on drug product sales levels. The Company records a contingent consideration obligation for such contingent payments at fair value on the acquisition date. The Company estimates the fair value of contingent consideration obligations through valuation models designed to estimate the probability of the occurrence of such contingent payments based on various assumptions and incorporating estimated success rates. Estimated payments are discounted using present value techniques to arrive at estimated fair value at the balance sheet date. Changes in the fair value of our contingent consideration obligations are recognized within our Consolidated Statements of Operations. Changes in the fair value of the contingent consideration obligations can result from changes to one or multiple inputs, including adjustments to the discount rates, changes in the amount or timing of expected expenditures associated with product development, changes in the amount or timing of cash flows from products upon commercialization, changes in the assumed achievement or timing of any development milestones, changes in the probability of certain clinical events and changes in the assumed probability associated with regulatory approval. These fair value measurements are based on significant inputs not observable in the market. Substantial judgment is employed in determining the appropriateness of these assumptions as of the acquisition date and for each subsequent period. Accordingly, changes in assumptions could have a material impact on the amount of contingent consideration expense the Company records in any given period.

Results of Operations

The following data summarize our results of operations for the following periods indicated:

	Three Months Ended March 31, 2015	Three Months Ended March 31, 2014
Revenue	$ 43,750	$ 43,750
Operating Loss	(29,632,743)	(11,212,498)
Net Loss	(28,683,993)	(13,982,700)
Earnings per Share (Basic and Diluted)	$ (0.51)	$ (0.31)

	Six Months Ended March 31, 2015	Six Months Ended March 31, 2014
Revenue	$ 214,500	$ 87,500
Operating Loss	(54,750,437)	(18,221,880)
Net Loss	(51,264,694)	(24,668,431)
Earnings per Share (Basic and Diluted)	$ (0.93)	$ (0.60)

The increase in our Operating Expenses during the three and six months ended March 31, 2015, is primarily due to the continued development of our lead clinical candidate for HBV, ARC-520 and our second clinical candidate ARC-AAT for AATD. The primary costs incurred during fiscal 2015 related to manufacturing of clinical supplies for our clinical trials, toxicology studies, and the cost associated with the administration of clinical trials. In addition, the Company is incurring costs, primarily manufacturing costs and clinical trial administration costs, as we prepare for a phase 2b clinical trial of ARC-520, which is anticipated to begin in 2015. Lastly, the Company incurred $10.1 million in expense associated with the acquisition of in-process research and development pre-clinical candidates from the Novartis asset acquisition.

Revenue

Total revenue was $43,750 and $214,500 for the three and six months ended March 31, 2015 and $43,750 and $87,500 for the three and six months ended March 31, 2014. Revenue is primarily related to licensed technology in both periods. In addition, the Company had collaboration revenue of $80,000 and earned $47,000 in revenue for delivering a materials study during the six months ended March 31, 2015.

Operating Expenses

The analysis below details the operating expenses and discusses the expenditures of the Company within the major expense categories. Certain reclassifications have been made to prior period operating expense categories to conform to the current period presentation. For purposes of comparison, the amounts for the three and six months ended March 31, 2015 and 2014 are shown in the tables below.

Research and Development Expenses – Three and six months ended March 31, 2015 compared to the three and six months ended March 31, 2014

R&D expenses are related to the Company's on-going research and development efforts, primarily related to program costs, composed primarily of outsourced costs related to the manufacturing of clinical supplies, toxicity/efficacy studies and clinical trial expenses. Internal costs primarily relate to operations at our research facility in Madison, Wisconsin, including facility costs and laboratory-related expenses. The following table provides details of research and development expense for the periods indicated:

(in thousands, except percentages)

	Three Months Ended March 31, 2015	% of Expense Category	Three Months Ended March 31, 2014	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
Laboratory supplies & services	$ 697	6%	$ 467	9%	$ 230	49%
In vivo studies	139	1%	111	2%	28	25%
Outside labs & contract services	105	1%	174	3%	(69)	-40%
Toxicity/efficacy studies	2,028	17%	1,171	23%	857	73%
Drug manufacturing	5,211	45%	2,057	39%	3,154	153%
Clinical trials	2,174	19%	926	18%	1,248	135%
License, royalty & milestones	1,012	9%	8	0%	1,004	12550%
Facilities and related	246	2%	286	6%	(40)	-14%
Other research expenses	29	0%	16	0%	13	81%
Total	$ 11,641	100%	$ 5,216	100%	$ 6,425	123%

	Six Months Ended March 31, 2015	% of Expense Category	Six Months Ended March 31, 2014	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
Laboratory supplies & services	$ 1,191	4%	$ 856	10%	$ 335	39%
In vivo studies	199	1%	173	2%	26	15%
Outside labs & contract services	231	1%	296	4%	(65)	-22%
Toxicity/efficacy studies	4,096	14%	1,692	20%	2,404	142%
Drug manufacturing	14,810	49%	3,286	39%	11,524	351%
Clinical trials	7,240	25%	1,509	18%	5,731	380%
License, royalty & milestones	1,035	4%	20	0%	1,015	5075%
Facilities and related	452	1%	479	6%	(27)	-6%
Other research expenses	133	1%	38	1%	95	250%
Total	$ 29,387	100%	$ 8,349	100%	$ 21,038	252%

Laboratory supplies and services expense increased by $230,000 from $467,000 during the three months ended March 31, 2014 to $697,000 during the current period. The expense also increased by $335,000 from $856,000 during the six months ended March 31, 2014 to $1,191,000 during the current period. The Company has expanded its laboratory facility and increased its R&D headcount. The increase in laboratory supplies and services is a result of the purchase of additional supplies necessary to support increased efforts in pre-clinical research as the Company supports ongoing clinical efforts and accelerates efforts to identify new clinical candidates.

In vivo studies expense increased by $28,000 from $111,000 during the three months ended March 31, 2014 to $139,000 during the current period. The expense also increased by $26,000 from $173,000 during the six months ended March 31, 2014 to $199,000 during the current period. In vivo expense can vary depending on the stage of preclinical candidates, the nature and amount of testing required and based on the varying costs of different in vivo testing models. The expense in both periods relates to studies related to development of new clinical candidates.

Outside labs and contract services expense decreased by $69,000 from $174,000 during the three months ended March 31, 2014 to $105,000 during the current period. The expense also decreased by $65,000 from $296,000 during the six months ended March 31, 2014 to $231,000 during the current period. The expense in both periods relates to services provided for oligonucleotide synthesis related to development of new clinical candidates.

Toxicity/efficacy studies expense increased by $857,000 from $1,171,000 during the three months ended March 31, 2014 to $2,028,000 during the current period. The expense also increased by $2,404,000 from $1,692,000 during the six months ended March 31, 2014 to $4,096,000 during the current period. This category includes IND-enabling toxicology studies as well as post-IND toxicology studies, such as long-term toxicology studies, and other efficacy studies. The current period expense primarily relates to IND-enabling toxicology studies related to ARC-AAT and studies related to ARC-520 to support our anticipated phase 2b clinical trial.

Drug manufacturing expense increased by $3,154,000 from $2,057,000 during the three months ended March 31, 2014 to $5,211,000 during the current period. The expense also increased by $11,524,000 from $3,286,000 during the six months ended March 31, 2014 to $14,810,000 during the current period. The current period expense relates to drug manufacturing to supply toxicology studies for our HBV Phase 2b clinical trial, clinical supplies for the HBV Phase 2b clinical trial, as well as clinical supplies for our clinical trial for ARC-AAT. The Phase 2b clinical trial for HBV will be a much larger study than previous clinical trials, and as such, the Company anticipates increased drug manufacturing expenses in future periods.

Clinical trials expense increased by $1,248,000 from $926,000 during the three months ended March 31, 2014 to $2,174,000 during the current period. The expense also increased by $5,731,000 from $1,509,000 during the six months ended March 31, 2014 to $7,240,000 during the current period. The increase is primarily driven by costs incurred in preparation for our anticipated phase 2b clinical trial for ARC-520. We expect clinical trial expenses to increase further throughout 2015 as enrollment in our clinical trials increases.

License, royalty and milestones expense increased by $1,004,000 from $8,000 during the three months ended March 31, 2014 to $1,012,000 during the current period. The expense also increased by $1,015,000 from $20,000 during the six months ended March 31, 2014 to $1,035,000 during the current period. This category can include milestone payments which can vary from period to period depending on the nature of our various license agreements, and the timing of reaching various development milestones requiring payment. During the three months ended March 31, 2015, we achieved a milestone by initiating a phase 1 clinical trial with ARC-AAT that required a $1 million payment.

Facilities expense decreased by $40,000 from $286,000 during the three months ended March 31, 2014 to $246,000 during the current period. The expense also decreased by $27,000 from $479,000 during the six months ended March 31, 2014 to $452,000 during the current period. The decrease relates to higher repairs and maintenance costs on our lab equipment incurred in fiscal 2014.

Other research expense increased by $13,000 from $16,000 during the three months ended March 31, 2014 to $29,000 during the current period. The expense also increased by $95,000 from $38,000 during the six months ended March 31, 2014 to $133,000 during the current period. The increase in the six month periods primarily relates to costs associated with a collaboration agreement to identify muscle targeting peptide molecules in fiscal 2015, for which the Company has been reimbursed from its collaboration partner.

Salaries – Three and Six months ended March 31, 2015 compared to the three and six months ended March 31, 2014

The Company employs scientific, technical and administrative staff at its corporate offices and its research facility. Salaries and payroll-related expense consists of salary, bonuses, payroll taxes and related benefits. Salary and payroll-related expenses include two major categories: general and administrative (G&A) compensation expense, and research and development (R&D) compensation expense, based on the primary activities of each employee. The following table provides detail of salary and payroll-related expenses for the periods indicated:

(in thousands, except percentages)

	Three Months Ended March 31, 2015	% of Expense Category	Three Months Ended March 31, 2014	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
R&D - compensation-related	$ 2,511	71%	$ 1,475	48%	$ 1,036	70%
G&A - compensation-related	1,031	29%	1,623	52%	(592)	-36%
Total	$ 3,542	100%	$ 3,098	100%	$ 444	14%

	Six Months Ended March 31, 2015	% of Expense Category	Six Months Ended March 31, 2014	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
R&D - compensation-related	$ 4,876	73%	$ 2,805	54%	$ 2,071	74%
G&A - compensation-related	1,816	27%	2,375	46%	(559)	-24%
Total	$ 6,692	100%	$ 5,180	100%	$ 1,512	29%

R&D compensation expense increased by $1,036,000 from $1,475,000 during the three months ended March 31, 2014 to $2,511,000 during the current period. The expense also increased by $2,071,000 from $2,805,000 during the six months ended March 31, 2014 to $4,876,000 during the current period. Increased headcount accounted for the majority of the change in compensation-related expense.

G&A compensation expense decreased by $592,000 from $1,623,000 during the three months ended March 31, 2014 to $1,031,000 during the current period. The expense also decreased by $559,000 from $2,375,000 during the six months ended March 31, 2014 to $1,816,000 during the current period. These decreases were due to the timing of bonus expenses in each period.

General & Administrative Expenses – Three and Six months ended March 31, 2015 compared to the three and six months ended March 31, 2014

The following table provides details of our general and administrative expenses for the periods indicated:

(in thousands, except percentages)

	Three Months Ended March 31, 2015	**% of Expense Category**	**Three Months Ended March 31, 2014**	**% of Expense Category**	**Increase (Decrease) $**	**Increase (Decrease) %**
Professional/outside services	$ 893	53%	$ 590	44%	$ 303	51%
Patent expense	157	9%	269	20%	(112)	-42%
Facilities and related	77	5%	48	4%	29	60%
Travel	141	8%	139	10%	2	1%
Business insurance	107	6%	57	4%	50	88%
Communication and Technology	192	11%	106	8%	86	81%
Office expenses	65	4%	96	7%	(31)	-32%
Other	65	4%	43	3%	22	51%
Total	$ 1,697	100%	$ 1,348	100%	$ 349	26%

	Six Months Ended March 31, 2015	**% of Expense Category**	**Six Months Ended March 31, 2014**	**% of Expense Category**	**Increase (Decrease) $**	**Increase (Decrease) %**
Professional/outside services	$ 2,136	57%	$ 997	44%	$ 1,139	114%
Patent expense	334	9%	401	18%	(67)	-17%
Facilities and related	153	4%	94	4%	59	63%
Travel	328	9%	239	11%	89	37%
Business insurance	213	6%	112	5%	101	90%
Communication and Technology	357	9%	164	7%	193	118%
Office expenses	145	4%	153	7%	(8)	-5%
Other	117	3%	101	5%	16	16%
Total	$ 3,783	100%	$ 2,261	100%	$ 1,522	67%

Professional/outside services include legal, accounting, consulting and other outside services retained by the Company. All periods include normally recurring legal and audit expenses related to SEC compliance and other corporate matters. Professional/outside services expense increased by $303,000 from $590,000 during the three months ended March 31, 2014 to $893,000 during the current period. The expense also increased by $1,139,000 from $997,000 during the six months ended March 31, 2014 to $2,136,000 during the current period. The increase in professional fees primarily related to professional recruiting fees for the hiring of additional R&D personnel to support and expand our clinical pipeline. Additionally, the Company incurred higher attorney's fees related to recent litigation events. See Note 7 – Commitments and Contingencies for further discussion.

Patent expense decreased by $112,000 from $269,000 during the three months ended March 31, 2014 to $157,000 during the current period. The expense also decreased by $67,000 from $401,000 during the six months ended March 31, 2014 to $334,000 during the current period. The Company continues to invest in patent protection for its DPC technology, related product candidates and other RNAi technology through patent filings in multiple countries. The Company expects to extend and maintain protection for its current portfolios, as appropriate, and file new patent applications as technologies are developed and improved.

Facilities-related expense increased by $29,000 from $48,000 during the three months ended March 31, 2014 to $77,000 during the current period. The expense also increased by $59,000 from $94,000 during the six months ended March 31, 2014 to $153,000 during the current period. Facilities expense increased due to the expansion of our corporate headquarters in Pasadena.

Travel expense increased by $2,000 from $139,000 during the three months ended March 31, 2014 to $141,000 during the current period. The expense also increased by $89,000 from $239,000 during the six months ended March 31, 2014 to $328,000 during the current period. Travel expense increased due to travel in support of our R&D function, primarily our GMP manufacturing campaign and our clinical trials.

Business insurance expense increased by $50,000 from $57,000 during the three months ended March 31, 2014 to $107,000 during the current period. The expense also increased by $101,000 from $112,000 during the six months ended March 31, 2014 to $213,000 during the current period. Business insurance costs increased primarily related to added coverage related to the Company's clinical trials.

Communication and technology expense increased by $86,000 from $106,000 during the three months ended March 31, 2014 to $192,000 during the current period. The expense also increased by $193,000 from $164,000 during the six months ended March 31, 2014 to $357,000 during the current period. The increase was related to the cost associated with new equipment related to new employees as well as upgrades to the Company's networks.

Office expense decreased by $31,000 from $96,000 during the three months ended March 31, 2014 to $65,000 during the current period. The expense also decreased by $8,000 from $153,000 during the six months ended March 31, 2014 to $145,000 during the current period. These expenses relate to conferences/training, office supplies, miscellaneous administrative expenses, and expenses related to office expansions at our R&D facility in Madison and our corporate headquarters in Pasadena.

Other expense was $65,000 and $117,000 during the three and six months ended March 31, 2015 as compared to $43,000 and $101,000 during the three and six months ended March 31, 2014. This category consists primarily of conference attendance fees, franchise and property tax expenses and marketing expenses.

Acquired in-process research and development – Novartis pre-clinical candidates

Acquired in-process research and development expense for the Novartis pre-clinical candidates was $10,142,786 for the three and six months ended March 31, 2015 and zero for the previous periods. This expense pertains to the acquisition of the Novartis RNAi assets discussed above. The pre-clinical candidates were expensed during the period, while certain other patents and a third-party license were capitalized as intangible assets.

Stock-based compensation expense

Stock-based compensation expense, a noncash expense, was $2,205,079 and $4,219,935 during the three and six months ended March 31, 2015, compared to $1,198,444 and $1,719,582 during the comparable prior period. Stock-based compensation expense is based upon the valuation of stock options and restricted stock units granted to employees, directors, and certain consultants. Many variables affect the amount expensed, including the Company's stock price on the date of the grant, as well as other assumptions. Based on the additional options and restricted stock units granted to new and existing employees in fiscal 2015, compensation expense has increased from the prior year.

Depreciation and amortization expense

Depreciation and amortization expense, a noncash expense, was $449,559 and $739,598 during the three and six months ended March 31, 2015, compared to $395,779 and $799,184 during the comparable prior period. The majority of depreciation and amortization expense relates to depreciation on lab equipment obtained as part of the acquisition of Roche Madison in 2011. In addition, the Company records depreciation on leasehold improvements at its Madison research facility and its Pasadena corporate headquarters as well as amortization of the recently intangible assets acquired in the Novartis asset acquisition.

Other income / expense

Other income / expense was income of $948,750 and $3,488,743 during the three and six months ended March 31, 2015, compared to expense of $2,770,202 and $6,446,551 in the comparable prior period. The primary component of other expense during each period was a change in the value of derivative liabilities related to certain warrants with a price adjustment feature, necessitating derivative accounting. The fluctuations in each period were primarily driven by changes in the Company's stock price, which had a corresponding impact to the valuation of the underlying warrants.

Liquidity and Cash Resources

Arrowhead has historically financed its operations through the sale of securities of Arrowhead and its Subsidiaries. Research and development activities have required significant capital investment since the Company's inception, and are expected to continue to require significant cash investment.

At March 31, 2015, the Company had cash on hand of approximately $96.4 million as compared to $132.5 million at September 30, 2014. Excess cash invested in fixed income securities was $31.9 million at March 31, 2015, compared to $44.7 million at September 30, 2014. The Company believes its current financial resources are sufficient to fund its operations through at least the next twelve months.

A summary of cash flows for the six months ended March 31, 2015 and 2014 is as follows:

	Six Months Ended March 31, 2015	Six Months Ended March 31, 2014
Cash Flow from Continuing Operations:		
Operating Activities	$ (40,569,584)	$ (14,720,054)
Investing Activities	4,299,211	(41,963,062)
Financing Activities	207,064	180,416,532
Net Increase (Decrease in Cash)	(36,063,309)	123,733,416
Cash at Beginning of Period	132,510,610	19,114,444
Cash at End of Period	$ 96,447,301	$ 142,867,860

During the six months ended March 31, 2015, the Company used $40.6 million in cash from operating activities, which represents the on-going expenses of its research and development programs and corporate overhead. Cash outlays were primarily composed of the following: research and development costs were $30.2 million, salary and payroll-related expenses were $6.7 million, and general and administrative costs were $3.8 million. Cash provided by investing activities was $4.3 million, primarily related to maturities on fixed income securities of $12.2 million, partially offset by cash paid for the acquisition of the Novartis RNAi assets of $7.0 million and capital expenditures of $0.9 million. Cash provided by financing activities of $0.2 million was driven by cash received from the exercise of warrants and stock options.

During the six months ended March 31, 2014, the Company used $14.7 million in cash from operating activities, which represents the on-going expenses of its research and development programs and corporate overhead. Cash outlays were primarily composed of the following: research and development costs were $7.2 million, salary and payroll-related expenses were $5.2 million, and general and administrative costs were $2.3 million. Cash used by investing activities was $42.0 million, primarily related to net cash investments in fixed income securities of $46.4 million and capital expenditures of $0.6 million, partially offset by maturities on fixed income securities of $5.0 milion. Cash provided by financing activities of $180.4 million includes $172.6 million of cash received from equity financings by the Company during 2013 as well as $8.0 million in cash received from the exercise of warrants and stock options.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements or relationships.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

There has been no material change in our exposure to market risk from that described in Item 7A of our Annual Report on Form 10-K for the year ended September 30, 2014, filed with the Securities and Exchange Commission on November 25, 2014.

ITEM 4. CONTROLS AND PROCEDURES

Our Chief Executive Officer and our Chief Financial Officer, after evaluating our "disclosure controls and procedures" (as defined in Rules 13a-15(e) and 15d-15(e)) of the Securities Exchange Act of 1934, as amended (the "Exchange Act") as of the end of the period covered by this Quarterly Report on Form 10-Q (the "Evaluation Date"), have concluded that, as of the Evaluation Date, our disclosure controls and procedures are effective to ensure that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and to ensure that information required to be disclosed by us in such reports is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer where appropriate, to allow timely decisions regarding required disclosure.

No change in the Company's internal controls over financial reporting (as defined in Rule 13a-15(f) and 15d-15(f) of the Exchange Act) occurred during the Company's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

From time to time, we may be involved in routine legal proceedings, as well as demands, claims and threatened litigation, which arise in the normal course of our business. We believe there is no litigation pending that, individually or in the aggregate, will have a material adverse effect on our results of operations or financial condition. The information contained in Note 7 to the Consolidated Financial Statements under the heading “Litigation” in Part I, Item 1 is incorporated herein by reference.

ITEM 1A. Risk Factors

There have been no material changes to the risk factors included in our Annual Report on Form 10-K for the year ended September 30, 2014. Please carefully consider the information set forth in this Quarterly Report on Form 10-Q and the risk factors discussed in Part I, “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the year ended September 30, 2014, which could materially affect our business, financial condition or future results. The risks described in our Annual Report on Form 10-K, as well as other risks and uncertainties, could materially and adversely affect our business, results of operations and financial condition, which in turn could materially and adversely affect the trading price of shares of our Common Stock. Additional risks not currently known or currently material to us may also harm our business.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

All information under this Item has been previously reported on our Current Reports on Form 8-K.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not Applicable.

ITEM 5. OTHER INFORMATION

None.

ITEM 6. EXHIBITS

Exhibit Number	Document Description
2.1	Asset Purchase and Exclusive License Agreement between Arrowhead Research Corporation and Novartis Institutes for Biomedical Research, Inc., dated March 3, 2015*†
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002*
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002*
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002**
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002**
101	The following materials from Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, formatted in XBRL (Extensible Business Reporting Language): (1) Consolidated Balance Sheets, (2) Consolidated Statements of Operations, (3) Consolidated Statement of Stockholders' Equity, (4) Consolidated Statements of Cash Flows, and (5) Notes to Consolidated Financial Statements. **

* Filed herewith

** Furnished herewith

† Certain schedules and exhibits to this agreement have been omitted pursuant to Item 601(b)(2) of Regulation S-K. A copy of any omitted schedule and/or exhibit will be furnished supplementally to the SEC upon request. Confidential treatment has been requested with respect to certain portions of this exhibit. Omitted portions have been filed separately with the Securities and Exchange Commission.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this Quarterly Report on Form 10-Q to be signed on its behalf by the undersigned, thereunto duly authorized.

Dated: May 11, 2015

ARROWHEAD RESEARCH CORPORATION

By: /s/ Kenneth A. Myszkowski
Kenneth A. Myszkowski
Chief Financial Officer

"THE USE OF THE FOLLOWING NOTATION IN THIS EXHIBIT INDICATES THAT A CONFIDENTIAL PORTION HAS BEEN OMITTED PURSUANT TO A REQUEST FOR CONFIDENTIAL TREATMENT AND THE OMITTED MATERIAL HAS BEEN FILED SEPARATELY WITH THE COMMISSION: [***]"

ASSET PURCHASE

AND

EXCLUSIVE LICENSE AGREEMENT

by and between

Arrowhead Research Corporation,
a Delaware corporation

and

Novartis Institutes for BioMedical Research, Inc.,
a Delaware corporation

March 3, 2015

TABLE OF CONTENTS

ASSET PURCHASE AND EXCLUSIVE LICENSE AGREEMENT

ASSET PURCHASE AND EXCLUSIVE LICENSE AGREEMENT (this "**Agreement**") dated as of March 3, 2015 (the "**Effective Date**") by and between Arrowhead Research Corporation, a Delaware corporation ("**Arrowhead**"), and Novartis Institutes for BioMedical Research, Inc., a Delaware corporation ("**Novartis**").

W I T N E S S E T H:

WHEREAS, Novartis is engaged in the business of discovering and developing products in the RNAi Field (as defined below) and owns or Controls certain Intellectual Property Rights and Information (as each such term is defined below) associated therewith;

WHEREAS, Novartis wishes to sell to Arrowhead the Intellectual Property Rights and Information owned by Novartis that relate exclusively to the RNAi Field and to grant to Arrowhead an exclusive license under the Intellectual Property Rights and Information of Novartis that are necessary for developing and commercializing products in the RNAi Field but which do not relate exclusively to the RNAi Field; and

WHEREAS, Arrowhead desires to purchase from Novartis such Intellectual Property Rights and Information that relate exclusively to the RNAi Field and to receive an exclusive license of such other Intellectual Property Rights and Information of Novartis, upon the terms and subject to the conditions hereinafter set forth.

NOW THEREFORE, in consideration of the terms and conditions and the respective representations, warranties, covenants and agreements set forth herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

ARTICLE 1
DEFINITIONS

Section 1.01. *Definitions*. (a) As used herein, the following terms have the following meanings:

"**1933 Act**" means the Securities Act of 1933.

"**1934 Act**" means the Securities Exchange Act of 1934.

"**Acquired RNAi Assets**" means the Assigned RNAi IP, the Assigned Licenses and the Assigned Other RNAi Assets.

"**Affiliate**" means, with respect to a Party, any entity or Person that controls, is controlled by, or is under common control with that Party. Solely for the purpose of this definition, "control" or "controlled" means, direct or indirect, ownership of fifty percent (50%) or more of the shares of stock entitled to vote for the election of directors in the case of a corporation or fifty percent (50%) or more of the equity interest in the case of any other type of legal entity; status as a general partner in any partnership; or any other arrangement whereby the entity or Person controls or has the right to control the board of directors or equivalent governing body of a corporation or other entity or the ability to cause the direction of the management or policies of a corporation or other entity. The Parties acknowledge that in the case of entities organized under the laws of certain countries where the maximum percentage ownership permitted by law for a foreign investor is less than fifty percent (50%), such lower percentage shall be substituted in the preceding sentence, provided that such foreign investor has the power to direct the management and policies of such entity.

"**Applicable Law**" means, with respect to any Person, any transnational, domestic or foreign federal, state or local law (statutory, common or otherwise), constitution, treaty, convention, ordinance, code, rule, regulation, order, injunction, judgment, decree, ruling or other similar requirement enacted, adopted, promulgated or applied by a Governmental Authority that is binding upon or applicable to such Person, as amended unless expressly specified otherwise.

"**Arrowhead Disclosure Schedule**" means the disclosure schedule delivered concurrently herewith by Arrowhead to Novartis and dated as of the date hereof.

"**Arrowhead Material Adverse Effect**" means a material adverse effect on the financial condition, business, assets or results of operations of Arrowhead and the Arrowhead Subsidiaries, taken as a whole, excluding any effect resulting from (a) changes in GAAP or the interpretation thereof, (b) changes in the general economic or political conditions or financial markets in the United States or elsewhere in the world, (c) changes (including changes of Applicable Law) or conditions generally affecting the industry in which Arrowhead and the Arrowhead Subsidiaries operate or (d) acts of war, sabotage or terrorism or natural disasters.

"Arrowhead RNAi Product" means any product which includes exogeneous double-stranded oligonucleotide molecules (i.e., RNA or modified variants thereof) to effect the cleavage of cellular RNA through the utilization of the guide strand in the cellular NA-induced silencing complex (RISC).

"**Arrowhead SEC Documents"** has the meaning set forth in Section 4.09(a).

"**Arrowhead Stock**" means the common stock, par value $0.001 per share, of Arrowhead.

"**Arrowhead Subsidiary**" means any entity of which securities or other ownership interests having ordinary voting power to elect a majority of the board of directors or other Persons performing similar functions are at the time directly or indirectly owned by Arrowhead.

"Assigned License" has the meaning set forth in Section 2.01(c).

"**Assigned Other RNAi Assets**" means the Assigned RNAi Books and Records and Regulatory Materials, research and toxicology reports, methods of synthesis, clinical plans, market diligence, drug substance, drug product and similar items or materials (in each case, other than the Assigned RNAi IP and the Assigned Licenses) that (a) specifically relate to (i) any of the Novartis RNAi Programs, (ii) any RNAi-related chemistry programs heretofore carried out by Novartis or any of its Affiliates, including any RNAi formats, modifications, formulations and delivery strategies developed or used by Novartis or any of its Affiliates or (iii) material target identity and target validation data for RNAi projects heretofore carried out by Novartis or any of its Affiliates or (b) otherwise exclusively relate to the Novartis RNAi Business or the RNAi Field.

"**Assigned RNAi Books and Records**" means original or true and complete copies of the books, records, files, work papers, laboratory notebooks, and other written or printed documents that are owned by Novartis or any of its Affiliates as of the Effective Date to the extent any of the foregoing contain Assigned RNAi Information.

"**Assigned RNAi Information**" means the Information owned or Controlled by Novartis or any of its Affiliates that is used exclusively in the Novartis RNAi Business or that exclusively relates to the RNAi Field, including Information used or generated in connection with or relating to (a) Novartis RNAi Programs, or (b) any RNAi-related chemistry programs heretofore carried out by Novartis or any of its Affiliates, including any RNAi formats, modifications, formulations and delivery strategies developed or used by Novartis or any of its Affiliates and (c) material target identity and target validation data for RNAi projects heretofore carried out by Novartis or any of its Affiliates, together with the Intellectual Property Rights (other than Patent Rights) embodied in or exclusively relating to any of the foregoing.

"**Assigned RNAi IP**" means the Assigned RNAi Patents and the Assigned RNAi Information.

"Assigned RNAi Patents" has the meaning set forth in Section 2.01(a).

"Assignment Prohibition" has the meaning set forth in Section 2.06.

"**Business Day**" means a day, other than Saturday, Sunday or other day on which commercial banks in New York, New York are authorized or required by Applicable Law to close.

"**Category 1 Target**" means each of [***] and [***].

"**Category 2 Target**" means [***].

"**Change of Control**" means, with respect to any Party, (a) a sale of all or substantially all of the assets, voting stock or securities of such Party, (b) a merger, reorganization, spin-off or consolidation involving such Party, in which the holders of common stock or similar equity interests of such Party immediately prior to such transaction cease to own collectively a majority of the voting equity securities of its successor entity or (c) the acquisition by any other Person, or group of other Persons acting in concert, of fifty percent (50%) or more of the voting equity securities of such Party.

"**Ciba-Isis Agreement**" means, collectively, the agreements between Isis Pharmaceuticals and Ciba-Geigy Limited, dated February 13, 1996, June 3, 1996 and November 9, 1998.

"**Clinical Trial**" means any human clinical trial of an RNAi Product, such as those described in 21 C.F.R. § 312.21, or a human clinical trial prescribed by the Regulatory Authorities in a foreign country.

"Closing" has the meaning set forth in Section 2.05.

"**Combination Product**" means any product that contains, in addition to a RNAi Product (or pharmaceutically active ingredient thereof), one or more other pharmaceutically active ingredients that are not RNAi Products.

"**Commercially Reasonable Efforts**" means, where applied to carrying out specific tasks and obligations of a Party under this Agreement, expending commercially reasonable, diligent, good faith efforts and resources to accomplish such task or obligation as such Party (on its own and/or acting through any of its Affiliates, sublicensees or subcontractors) would normally use to accomplish a similar task or obligation under similar circumstances exercising reasonable business judgment, it being understood and agreed that, with respect to Arrowhead's obligations in Section 6.04(a) to the manufacture, development and commercialization of an RNAi Product, such efforts shall be substantially equivalent to those efforts and resources commonly used in the pharmaceutical or biotechnology industry by a similarly situated company of similar size and experience in the exercise of its reasonable business discretion with respect to a product with similar characteristics at a similar stage in its development or product life, that is of similar commercial potential, taking into account actual or potential issues including, but not limited to, issues relating to efficacy, safety, manufacturing, quality, supply, regulatory or market exclusivity, Patents and intellectual property protection, product profile, labelling, pricing, reimbursement, distribution, market potential, competitive conditions, the regulatory environment, and any other technical, legal, scientific, medical, operational or commercial factors that could reasonably be expected to affect the profitability of such product by such Party in an active and ongoing program to manufacture, develop and commercialize a product owned by it or to which it has exclusive rights, which product is of similar economic potential as the RNAi Product, and at a similar stage in its development or product life as the RNAi Product.

"**Control**" or "**Controlled**" means, with respect to any Intellectual Property Rights or Information, that a Party has the legal authority or right (whether by ownership, license or otherwise) to grant a license, sublicense, access or other right (as applicable) under such Intellectual Property Right or Information to the other Party on the terms and conditions set forth herein, in each case without breaching the terms of any agreement with a Third Party, or misappropriating the Information of a Third Party.

"**Cover**," "**Covered**" or "**Covering**" means that an issued or applied for patent claim encompasses a particular process, method, machine, article of manufacture, or composition of matter, such that any making, using, offering to sell, selling, supplying, importing or exporting of the process, method, machine, article of manufacture, or composition of matter, without a license, would (a) in the case of any such issued patent claim, constitute infringement of such patent claim or (b) in the case of any such applied for patent claim, constitute infringement of such patent claim were such patent claim to issue.

"**Current Representation**" has the meaning set forth in Section 8.13.

"**Damages**" has the meaning set forth in Section 7.02(a).

"**Deductible**" has the meaning set forth in Section 7.02(c).

"**Designated Person**" has the meaning set forth in Section 8.13.

"**Data Package**" has the meaning set forth in Section 6.01(c).

"**Enforcing Party**" has the meaning set forth in Section 2.08.

"**Exclusive License**" has the meaning set forth in Section 2.02.

"**Exclusivity Agreement**" means that certain letter agreement between Novartis and Arrowhead, dated September 26, 2014, as amended.

"**Exclusivity Period**" has the meaning set forth in Section 6.01(e).

"**Initial Target**" means each of [***], [***] and [***]. These targets are collectively referred to herein as the "**Initial Targets**".

"**FDA**" means the U.S. Food and Drug Administration or any successor entity.

"**First Commercial Sale**" means, with respect to any RNAi Product in any given country, (a) the date following the receipt of any applicable Regulatory Approval on which such RNAi Product is first sold in such country by Arrowhead or any of its Affiliates, or its or their respective licensee or sublicensee, to or for the benefit of end-users of such RNAi Product or (b) if no such Regulatory Approval is required, the date on which such RNAi Product is first commercially launched in such country for sale to or for the benefit of end-users of such product.

"**GAAP**" means generally accepted accounting principles in the United States.

"**Generic Version**" has the meaning set forth in Section 6.02.

"**Governmental Authority**" means any transnational, domestic or foreign federal, state or local governmental, regulatory or administrative authority, department, court, agency or official, including any political subdivision thereof.

"IFRS" means International Financial Reporting Standards.

"**Indemnified Party**" has the meaning set forth in Section 7.03(a).

"**Indemnifying Party**" has the meaning set forth in Section 7.03(a).

"**Information**" means any information, discoveries, developments and inventions, trade secrets or technology, whether or not patentable or proprietary and whether stored or transmitted in oral, documentary, electronic or other form. Information shall include ideas, concepts, formulas, compositions, plans, documents, results and data of any type, in any tangible or intangible form, including without limitation, works of authorship, databases, practices, methods, designs, processes, procedures, protocols and techniques, specifications, biological materials, master batch records, technology, formulations, formulae, knowledge, know-how, including any information relating to research and development plans, experiments, results, compounds, therapeutic leads, candidates and products, clinical and pre-clinical data, clinical trial results, and manufacturing know-how, information, plans and skills, information in customer lists and purchasing records, supplier lists, physician call lists, experience, training materials, test data, including pharmacological, biological, chemical, biochemical, toxicological, safety and pre-clinical or clinical information or test data, analytical, quality assurance and quality control data, stability data, studies and procedures, technical data, and patent and other legal information or descriptions.

"**Initiation**" of a Clinical Trial means the first dosing of the first subject in such Clinical Trial. "**Initiate**" has a correlative meaning.

"**Intellectual Property Right(s)**" means any and all intellectual property rights arising from or associated with the following, protected, created or arising under Applicable Law: (a) Patent Rights, including provisional, design and utility models and any similar or equivalent statutory rights with respect to the protection of inventions, and all applications for any of the foregoing; (b) Information, including know-how, processes, methods and other information protected as trade secrets under Applicable Law; (c) Trademarks and the applications for registration and registrations thereof; (d) rights to protect and limit the use or disclosure of trade secrets and confidential information; (e) copyrights (registered and unregistered), copyright applications, and copyright registrations; and (f) other similar types of proprietary intellectual property rights.

"**IP Assignment Agreements**" means the Intellectual Property Rights assignment agreements substantially in the form of Exhibit A.

"**Joined Party**" has the meaning set forth in Section 2.08.

"**Joint Counsel**" has the meaning set forth in Section 2.07(b).

"**knowledge of Arrowhead**," "**Arrowhead's knowledge**" or any other similar knowledge qualification in this Agreement means to the actual knowledge of Chris Anzalone, Bruce Given, David Lewis, James Hamilton, Patrick O'Brien and Kenneth Myszkowski, after due inquiry.

"**knowledge of Novartis**," "**Novartis' knowledge**" or any other similar knowledge qualification or reference in this Agreement means to the actual knowledge of John Hastewell, Gary Sutton, and Frank Wu, after due inquiry.

"**Licensed RNAi IP**" means the Licensed RNAi Patents, the Intellectual Property Rights licensed to Novartis under the Ciba-Isis Agreement, and any other Intellectual Property Rights and Information (in each case, other than Assigned RNAi IP) owned or Controlled by Novartis or any of its Affiliates that Cover, are necessary for or that otherwise specifically relate to the Novartis RNAi Business or the RNAi Field.

"**Licensed RNAi Patents**" means the Patent Rights that are listed on Section 2.02 of the Novartis Disclosure Schedule.

"**Lien**" means, with respect to any property or asset, any mortgage, lien, pledge, charge, security interest or encumbrance in respect of such property or asset.

"**Net Sales**" means, with respect to a given period of time, gross sales of RNAi Products by Arrowhead, its Affiliates and its or its Affiliates' licensees in such period, less the following deductions that are actually incurred, allowed, paid, accrued or specifically allocated to such gross sales of RNAi Products (all as determined in accordance with GAAP or, if such sales are made by a Person that does not report sales in accordance with GAAP, in accordance with IFRS, in either case as consistently applied by Arrowhead, its Affiliates and its or its Affiliates' licensees in its officially audited statements):

(a) credits or allowances actually granted for damaged RNAi Products, recalls returns or rejections of RNAi Products, price adjustments, billing errors write offs of bad debt or allowances or credits granted on account of requirements of any governmental authority;

(b) distributor or wholesaler fees, rebates or allowances actually granted, allowed or incurred, including governmental and managed care payments; pharmacy benefit managers (or equivalents thereof); federal, state/provincial, local and other governments, their agencies and purchasers and reimbursers; or to trade customers;

(c) normal and customary trade, cash and quantity discounts, and credits;

(d) distribution services agreement fees allowed or paid to Third Party distributors;

(e) transportation costs, including insurance, for outbound freight related to delivery of RNAi Products to the extent included in the gross amount invoiced;

(f) sales taxes, value added taxes and other taxes (other than income) directly applied to the sale of RNAi Products to the extent included in the gross amount invoiced; and

(g) any other items that reduce gross sales amounts as required by GAAP or IFRS.

Sales of RNAi Products between or among Arrowhead and its Affiliates shall be excluded from the computation of Net Sales, but the subsequent final sales of RNAi Products to Third Parties by such Affiliates shall be included in the computation of Net Sales.

Notwithstanding the foregoing, in the event a RNAi Product is sold in any country as a Combination Product, Net Sales of the Combination Product will be calculated as follows:

1. If such RNAi Product and other product(s) each are sold separately in such country, Net Sales will be calculated by multiplying the total Net Sales (as described above) of the Combination Product by the fraction A/(A+B), where A is the average gross selling price in such country of such RNAi Product sold separately, and B is the sum of the average gross selling prices in such country of such other product(s) sold separately, during the applicable quarter, or if sales of both the RNAi Product and the other product(s) did not occur in such period, then the most recent royalty reporting period in which such separate sales of both such RNAi Product and the other product(s) occurred.

2. If such RNAi Product is sold independently of the other product(s) therein in such country, but the average selling price of such other product(s) cannot be determined, Net Sales will be calculated by multiplying the total Net Sales (as described above) of the Combination Product by the fraction A/C, where A is the average selling price in such country of such RNAi Product sold independently and C is the average selling price in such country of the entire Combination Product.

3. If the other product(s) are sold independently of such RNAi Product therein in such country, but the average selling price of such RNAi Product cannot be determined, Net Sales will be calculated by multiplying the total Net Sales (as described above) of the Combination Product by the fraction [1-(B/C)], where B is the average selling price in such country of such other product(s) and C is the average selling price in such country of the entire Combination Product.

4. If neither such RNAi Product nor the other product(s) are sold independently in such country, Net Sales for such Combination Product shall be determined by Arrowhead in its reasonable discretion based on the relative contribution of such RNAi Products and the other product(s) in the Combination Product.

"**New Target**" means any target that is not an Initial Target.

"**Novartis-Alnylam Agreement**" means the Research Collaboration and License Agreement dated October 12, 2005, as amended, between Novartis and Alnylam Pharmaceuticals, Inc.

"**Novartis Disclosure Schedule**" means the disclosure schedule delivered concurrently herewith by Novartis to Arrowhead and dated as of the date hereof.

"**Novartis Materials**" has the meaning set forth in Section 5.12.

"**Novartis RNAi Business**" means the business in which Novartis or any of its Affiliates are engaged as of the Effective Date of developing and commercializing products in the RNAi Field, including all of the activities associated with the Novartis RNAi Programs, and any RNAi-related chemistry programs heretofore carried out by or for Novartis or any of its Affiliates, including any RNAi formats, modifications, formulations and delivery strategies developed or used by or for Novartis or any of its Affiliates.

"**Novartis RNAi IP**" means the Assigned RNAi IP and Licensed RNAi IP.

"**Novartis RNAi Programs**" means the research and development programs carried out by Novartis or any of its Affiliates in the RNAi Field.

"**Opt-In Notice**" has the meaning set forth in Section 6.01(c).

"**Out-License**" means, with respect to any ROFN Candidate, (a) when used as a verb, to license and/or sell to a Third Party the right to market, promote, detail, distribute, offer for sale and/or sell such ROFN Candidate in any country and (b) when used as a noun, the license or sale to a Third Party of the right to market, promote, detail, distribute, offer for sale and/or sell such ROFN Candidate in any country. For the avoidance of doubt, an Out-License of a ROFN Candidate shall be deemed to include a sale of all or substantially all of the equity interests in one or more Affiliates of Arrowhead that hold all or substantially all of Arrowhead's and its Affiliates' right to test, make, market, promote, detail, distribute, offer for sale and/or sell such ROFN Candidate in any country; *provided* that a Change of Control with respect to Arrowhead shall not constitute an Out-License of a ROFN Candidate.

"**Party**" means Arrowhead or Novartis. "**Parties**" means Arrowhead and Novartis.

"**Patent Rights**" means all patents (including all reissues, reexamined patents, extensions, substitutions, confirmations, re-registrations, invalidations, supplementary protection certificates and patents of addition), patent applications (including all provisional, continuation, continuation-in-part, divisional, reexamination, and reissue applications), as well as design patents, utility models or applications therefor, together with any and all foreign or international counterparts of any of the foregoing, and all other patent applications which claim a right of priority thereto, any patents issuing on any of the foregoing, and any and all patents and patent applications (and patents issuing thereon), issued by or filed in any jurisdiction anywhere in the world.

"**Patent Service Provider**" has the meaning set forth in Section 5.08.

"**Person**" means an individual, corporation, partnership, limited liability company, association, trust or other entity or organization, including a Governmental Authority.

"**Phase 1 Clinical Trial**" means a Clinical Trial of an RNAi Product that would satisfy the requirements of 21 C.F.R. § 312.21(a), as amended from time to time, or equivalent law or regulation in regulatory jurisdictions outside the U.S.

"**Phase 2 Clinical Trial**" means a Clinical Trial of an RNAi Product that would satisfy the requirements of 21 C.F.R. § 312.21(b), as amended from time to time, or equivalent law or regulation in regulatory jurisdictions outside the U.S.

"**Phase 3 Clinical Trial**" means a pivotal Clinical Trial of an RNAi Product that would satisfy the requirements of 21 C.F.R. § 312.21(c), as amended from time to time, or equivalent law or regulation in regulatory jurisdictions outside the U.S.

"**Post-Closing Representation**" has the meaning set forth in Section 8.13.

"**Potential Contributor**" has the meaning set forth in Section 7.06.

"**Purchase Price**" has the meaning set forth in Section 2.03.

"**Regulatory Approval**" means, with respect to a RNAi Product in a given country, the approval of the applicable Regulatory Authority necessary for the marketing and sale of such RNAi Product in such country.

"**Regulatory Authority**" means the U.S. Food and Drug Administration or other Governmental Authorities (within or outside the United States) charged with the authority to regulate the pricing, marketing, promotion, manufacture, testing, distribution or sale of pharmaceutical products in a country or countries.

"**Regulatory Materials**" means, with respect to a Novartis RNAi Program , the regulatory applications, submissions, presentations, meeting minutes, notifications, communications, correspondence, responses, registrations, and/or other filings made to, received from or otherwise conducted with a Governmental Authority; copies of all registration dossiers and packages, labels and regulatory certificates; correspondence with the FDA, the United States Drug Enforcement Administration, any European Union Notified Body, the Ministry of Health, Labor and Welfare of Japan, or any other similar Governmental Authority in any country or jurisdiction, to the extent relating to the Novartis RNAi Program; vigilance reports (including, but not limited to, annual reports, expedited safety reports, and periodic safety update reports), to the extent relating to the Novartis RNAi Program; relevant pricing information; medical inquiries; written responses thereto and standard communication letters to healthcare providers, suppliers, customers or patients, including: (a) complete copies of regulatory files, including clinical data, and rights of reference; (b) a copy of the safety surveillance database; (c) copies of the variations and all correspondence related thereto; (d) copies of all labeling for all stock keeping units for all configurations of the related product; (e) copies of all expert reports, pre-clinical and clinical reports; (f) copies of all FDA establishment inspection reports, inspectional observations on FDA Form 483s, responses thereto, and any other similar reports, observations, or responses from any other Regulatory Authority, including Health Canada or the European Union Notified Bodies (or any of its competent authorities); (g) enforcement letters issued by any Regulatory Authority relating to the Product; and (h) copies of all European Union Notified Body audit reports, certificates issued by a European Union Notified Body (including ISO 13485:2003 / EN ISO 13485:2012), certificates of compliance with the Medical Device Directive 93/42/CE, and its amendments, issued by a European Union Notified Body, in each case, to the extent relating to the Novartis RNAi Program, and all correspondence related to any of the foregoing.

"**Remainder**" has the meaning set forth in Section 2.08.

"**Required Third Party Payments**" shall mean royalty payments due to a Third Party from Arrowhead to license the Third Party's Intellectual Property Rights which are reasonably necessary for Arrowhead to research, develop, make, have made, sell, offer to sell or import RNAi Products.

"**Resale Registration Statement**" has the meaning set forth in Section 2.09(b).

"**RNAi Business Registered IP**" has the meaning set forth in Section 3.06(b).

"**RNAi Field**" means the use of exogenous double-stranded oligonucleotide (i.e, RNA or modified variants thereof) molecules to effect the cleavage of cellular RNA through the utilization of the guide strand in the cellular RNA-induced silencing complex (RISC); notwithstanding the foregoing, however, the RNAi Field shall exclude: (a) single-stranded antisense approaches (including, for example, RNAseH cleavage of mRNA); (b) the use of RNA as a therapeutic for protein expression (therapeutic mRNA); (c) genome editing (for example, CRISPR and CRISPR-like approaches); (d) inclusion of miRNA or RNAi constructs in gene therapy vectors; (e) the use of RNA in CART technology; and (f) the use of RNA in vaccines.

"**RNAi IP**" means the Novartis RNAi IP and any Intellectual Property Rights licensed to Novartis or its Affiliates under any of the Assigned Licenses.

"**RNAi Product**" means any product which: (a) includes exogeneous double-stranded oligonucleotide molecules (i.e., RNA or modified variants thereof) to effect the cleavage of cellular RNA through the utilization of the guide strand in the cellular RNA-induced silencing complex (RISC); and (b) is Covered by any of the RNAi IP or is based on, embodies, or incorporates, or was otherwise generated using any of the RNAi IP. The subset of RNAi Products which are Covered by the Intellectual Property Rights licensed under the Novartis-Alnylam Agreement but are not Covered by any other RNAi IP are each referred to herein as an "**RNAi Product – Alnylam Only**".

"Roche-Arrowhead Agreement" means the agreement among Arrowhead Research Corporation, Hoffman-La Roche Inc., and F. Hoffman-La Roche Ltd. dated as of October 21, 2011.

"**ROFN Candidate**" has the meaning set forth in Section 6.01(b).

"**ROFN Rights**" has the meaning set forth in Section 6.01(b).

"**Royalty Period**" has the meaning set forth in Section 6.02(c).

"**Rule 144**" has the meaning set forth in Section 5.06.

"**Shares**" has the meaning set forth in Section 2.04.

"**Tax**" means any tax, governmental fee or other like assessment or charge of any kind whatsoever (including, but not limited to, all federal, state, local, foreign, income, gross receipts, license, payroll, employment, excise, escheat, severance, stamp, occupation, premium, windfall, profits, environmental, customs, duties, capital stock, franchise, profits, withholding, social security (or similar, including FICA), unemployment, disability, real property, personal property, sales, use, transfer, registration, value added, alternative or add-on minimum, or estimated tax), together with any interest, penalty, addition to tax or additional amount, and any liability for any of the foregoing as transferee or successor, by contract or otherwise.

"**Tax Return**" means any Tax return, statement, report, election, declaration, disclosure, schedule, claim for refund, form, statement or document (including any estimated tax or information return or report) related to Taxes, including any schedule or attachment thereto, and including any amendment thereof.

"**Taxing Authority**" means any Governmental Authority responsible for the imposition or collection of any Tax.

"**Technology Transfer Plan**" has the meaning set forth in Section 5.11(a).

"**Term Sheet Period**" has the meaning set forth in Section 6.01(d).

"**Third Party**" means any Person other than Arrowhead, Novartis or any of their respective Affiliates.

"**Third Party Claim**" has the meaning set forth in Section 7.03(a).

"**Trademarks**" means any and all trademarks, trade names, corporate names, company names, business names, service marks, logos, brand names, domain names and all other source or business identifiers, and the rights in any of the foregoing which arise under Applicable Law, including all goodwill symbolized thereby or associated therewith.

"**Transaction Documents**" means this Agreement and all agreements attached as exhibits hereto.

"**Valid Claim**" means, as applicable, an enumerated claim in: (a) any unexpired and issued patent included within the RNAi IP, as well as any patent filed by or on behalf of Arrowhead after the Closing which claims priority to, or shares a common priority date with, any such patent within the RNAi IP, in each case to the extent that such patents have not been disclaimed, canceled, revoked or held invalid, unenforceable, or otherwise unpatentable, by a final non-appealable decision of a court of competent jurisdiction or other Governmental Authority; or (b) any pending patent application for any applicable country: (i) that is on file with the applicable patent office and has shown evidence of reasonably consistent activity to advance to issuance of a patent, (ii) which application has been on file with the applicable patent office for no more than five years from the earliest date to which the patent application claims its earliest priority, *provided* that the period shall extend to seven years from the earliest date to which the patent application claims its earliest priority for any application with the patent office in Japan, and (iii) which is either included within the RNAi IP or was filed by or on behalf of Arrowhead or any of its Affiliates after Closing, but claims priority to, or shares a common priority date with, any patent or patent application included within the RNAi IP.

"**Warranty Breach**" has the meaning set forth in Section 7.02(a).

Section 1.02. *Other Definitional and Interpretative Provisions*. The words "hereof," "herein" and "hereunder" and words of like import used in this Agreement shall refer to this Agreement as a whole and not to any particular provision of this Agreement. The captions herein are included for convenience of reference only and shall be ignored in the construction or interpretation hereof. References to Articles, Sections, Exhibits and Schedules are to Articles, Sections, Exhibits and Schedules of this Agreement unless otherwise specified. All Exhibits and Schedules annexed hereto or referred to herein are hereby incorporated in and made a part of this Agreement as if set forth in full herein. Any capitalized terms used in any Exhibit or Schedule but not otherwise defined therein, shall have the meaning as defined in this Agreement. Any singular term in this Agreement shall be deemed to include the plural, and any plural term the singular. Whenever the words "include," "includes" or "including" are used in this Agreement, they shall be deemed to be followed by the words "without limitation," whether or not they are in fact followed by those words or words of like import. "Writing," "written" and comparable terms refer to printing, typing and other means of reproducing words (including electronic media) in a visible form. References to any statute shall be deemed to refer to such statute as amended from time to time and to any rules or regulations promulgated thereunder. References to any agreement or contract are to that agreement or contract as amended, modified or supplemented from time to time in accordance with the terms hereof and thereof. References to any Party include the successors and permitted assigns of that Party. References from or through any date mean, unless otherwise specified, from and including or through and including, respectively. References to "law," "laws" or to a particular statute or law shall be deemed also to include any and all Applicable Law.

ARTICLE 2
CLOSING

Section 2.01. *Purchase, Sale and Transfer; Retained Research Right*. Upon the terms and subject to the conditions of this Agreement, at the Closing:

(a) Novartis agrees to sell, convey, transfer, assign and deliver to Arrowhead, and Arrowhead agrees to acquire and accept, all of Novartis' right, title and interest in, to and under (i) the Patent Rights listed on Section 2.01(a) of the Novartis Disclosure Schedule and the inventions claimed therein, including the rights to file, prosecute, obtain issuance of, maintain and enforce U.S., foreign or international counterparts thereof, and continuations, continuations-in-part, divisions, extensions, reissues, reexaminations, and renewals of any of the foregoing, and other patent applications that claim the inventions claimed in such applications and have a right of priority thereto, including all rights in any patents issuing on any of the foregoing (collectively, the "**Assigned RNAi Patents**"); (ii) all causes of action (whether known or unknown or whether currently pending, filed, or otherwise) and other enforcement rights under, or on account of, any of the Assigned RNAi Patents, including, without limitation, all causes of action and other enforcement rights for (A) damages, (B) injunctive relief, (C) inventorship rights and (D) any other remedies of any kind for past, current and future infringement; and (iii) rights to collect royalties or other payments under or on account of any of the Assigned RNAi Patents;

(b) Novartis agrees to sell, convey, transfer, assign and deliver to Arrowhead, and Arrowhead agrees to acquire and accept, all of Novartis' right, title and interest in, to and under all Assigned RNAi Information;

(c) subject to Section 2.05, Novartis agrees to sell, convey, transfer, assign and deliver to Arrowhead, and Arrowhead agrees to acquire and accept, all of Novartis' right, title and interest in and to, and Arrowhead agrees to assume, perform and discharge all of the obligations and liabilities of Novartis under, the license agreements to which Novartis is party that are listed on Section 2.01(c) of the Novartis Disclosure Schedule (each, an "**Assigned License**" and, collectively, the "**Assigned Licenses**"); and

(d) Novartis agrees to sell, convey, transfer, assign and deliver to Arrowhead, and Arrowhead agrees to acquire and accept, all of Novartis' right, title and interest in, to and under all Assigned Other RNAi Assets.

(e) Notwithstanding the foregoing, Novartis and its Affiliates shall retain a non-exclusive, perpetual, irrevocable and worldwide right and license with the right to grant sublicenses through multiple tiers under or with respect to the Novartis RNAi IP solely for research purposes in the course of developing therapeutic products outside of the RNAi Field.

Section 2.02. *Grant of Exclusive License; Sublicensing*
. Upon the terms and subject to the conditions of this Agreement, effective at the Closing, Novartis hereby grants to Arrowhead, and Arrowhead agrees to acquire and accept, an exclusive (including as to Novartis and its Affiliates), worldwide right and license, solely in the RNAi Field, with the right to grant sublicenses through multiple tiers under or with respect to the Licensed RNAi IP to make and have made, to use and have used, to sell and have sold, to offer for sale, to import, to research, develop and improve and to otherwise commercially exploit in any manner RNAi Products (the "**Exclusive License**"). Each sublicense granted by Arrowhead (for clarity, including any further sublicenses granted by any sublicensee) shall be consistent with the terms and conditions of this Agreement. Arrowhead shall be solely responsible for all activities of its sublicensees relating to this Agreement, and any act or omission of its sublicensees that would be a breach of this Agreement if undertaken by Arrowhead, shall be deemed a breach of this Agreement by Arrowhead. If Arrowhead becomes aware of a material breach by a sublicensee under this Agreement, Arrowhead will promptly notify Novartis in writing of the particulars of the same, and will use Commercially Reasonable Efforts to enforce the terms of such sublicense.

Section 2.03. Purchase Price

*Section 2.04. . The purchase price for the Acquired RNAi Assets and the Exclusive License (the "**Purchase Price**") is and shall be paid as follows:*

(a) $10,000,000 in cash, of which Novartis acknowledges that $7,000,000 has previously been paid pursuant to the Exclusivity Agreement, and with the remainder to be due and payable on or before March 29, 2015;

(b) $10,000,000, payable in Arrowhead Stock in accordance with Section 2.01(a)(i);

(c) $15,000,000, payable in Arrowhead Stock on a payment date selected by Arrowhead on or before March 29, 2015;

(d) the royalty payments, when, as and if due under Section 6.02; and

(e) the milestone payments, when, as and if due under Section 6.03.

2.04 *Arrowhead Stock Valuation*. In valuing the Arrowhead Stock payable pursuant to Section 2.03 (all such shares of Arrowhead Stock being collectively referred to herein as the "**Shares**"), the number of shares to be delivered shall be calculated based on the average closing price of the Arrowhead Stock, as reported on the NASDAQ Global Market, for the ten trading days ending two trading days immediately prior to the applicable payment date. If the issuance of all or any portion of the Shares would require the approval of Arrowhead's stockholders pursuant to Rule 5635(A)(1) of the NASDAQ Listing Rules and such approval has not been obtained on or prior the applicable payment date, then Arrowhead shall (i) issue to Novartis the maximum number of Shares issuable to Novartis in compliance with Rule 5635(A)(1) of the NASDAQ Listing Rules in the absence of such stockholder approval, and (ii) pay to Novartis an amount in cash equal to the difference in value.

Section 2.05. *Closing* (a). The closing (the "**Closing**") of the transactions contemplated hereunder shall take place at the offices of Gibson, Dunn & Crutcher, LLP, 555 Mission Street, Suite 3000, San Francisco, California, on the Effective Date. At the Closing:

(a) Arrowhead shall deliver:

(i) to Arrowhead's registered transfer agent, with a copy to Novartis, irrevocable instructions, executed by an officer of Arrowhead and in a form reasonably acceptable to Novartis, instructing the transfer agent (A) to issue certificates for the Arrowhead Stock due under Section 2.03(b), registered in the name of Novartis (or such other Person as Novartis may designate), with any required transfer stamps affixed thereto and bearing the legend required pursuant to Section 2.09, and (B) to deliver such certificates to such address as Novartis may designate (it being understood that (x) Arrowhead shall use best efforts to cause the issuance and delivery of such share certificates as contemplated herein within five Business Days after the Closing and (y) such issuance shall be effective as of the Closing and the transfer agent shall be instructed accordingly); and

(ii) to Novartis, counterparts to each of the other Transaction Documents, duly executed by Arrowhead and each of its Affiliates party thereto.

(b) Novartis shall deliver to Arrowhead:

(i) all the IP Assignment Agreements that are in Novartis' possession or under its control with respect to the Assigned RNAi IP, duly executed by Novartis, and such customary bills of sale and/or other agreements or instruments of transfer, in each case as are reasonably satisfactory to Arrowhead and Novartis, to the extent necessary to evidence the transfer of the Acquired RNAi Assets, and other rights and licenses transferred to Arrowhead pursuant to Section 2.01 to Arrowhead or to vest in Arrowhead sole and exclusive ownership thereof;

(ii) (A) originals of all invention assignments under which the inventor(s) of the inventions that are included in the Assigned RNAi Patents have assigned the inventions or any related Patent Rights to Novartis, (B) documents associated with prosecution of the patent applications included in the Assigned RNAi Patents that are in Novartis' possession or under its control, including any unpublished patent applications included in the Assigned RNAi Patents, and (C) all other documents in Novartis' possession or under its control constituting, comprising or directly relating to the investigation, evaluation, preparation, prosecution, maintenance, defense or filing of the patent applications included in the Assigned RNAi Patents, including any materials in Novartis' possession or under its control relating to conception and reduction to practice of the inventions that are included in the Assigned RNAi Patents; and

(iii) counterparts to each of the other Transaction Documents, duly executed by Novartis.

Section 2.06. *Understanding Regarding Assignment of Licenses and Rights.* Notwithstanding anything to the contrary herein, this Agreement shall not constitute an agreement to assign any Assigned License or any claim or right or any benefit arising thereunder if such assignment, without the consent of a Third Party thereto, would constitute a breach or other contravention of such contract (an "**Assignment Prohibition**"); provided that the foregoing shall not limit or affect Novartis' representations and warranties in Article 3. If an Assignment Prohibition shall exist, each Party shall, and shall cause its Affiliates to, use its Commercially Reasonable Efforts to obtain the consent of the other parties to any such Assigned License or any claim or right or any benefit arising thereunder for the assignment thereof pursuant to Section 2.01(c), as Arrowhead may reasonably request (provided that neither Novartis nor any Affiliate of Novartis shall be required to expend money or grant any accommodation (financial or otherwise) to any Third Party in connection therewith). If such consent is not obtained, or if an attempted assignment thereof would be ineffective or would adversely affect the rights of Novartis thereunder so that Arrowhead would not in fact receive all such rights, Novartis and Arrowhead shall cooperate in a mutually agreeable arrangement under which Arrowhead would obtain the benefits and assume the obligations thereunder in accordance with this Agreement, including sub-contracting, sub-licensing, or sub-leasing to Arrowhead, or under which Novartis would enforce (at the direction of Arrowhead) for the benefit of Arrowhead, with Arrowhead assuming Novartis' obligations, any and all rights of Novartis against a Third Party thereto (including, if applicable, the right to elect to terminate such Assigned License in accordance with the terms thereof upon Arrowhead's request); provided that neither Novartis nor any Affiliate of Novartis shall be required to expend money or grant any accommodation (financial or otherwise) to any Third Party in connection therewith, unless Arrowhead agrees to promptly reimburse Novartis or its Affiliates (as applicable) for any such expenses. Promptly after any required consents to assignment are obtained for any such Assigned License after the Closing, such Assigned License shall be transferred and assigned to Arrowhead.

Section 2.07. *Patent Prosecution.*

(a) Subject to the Novartis-Alnylam Agreement, Arrowhead, at its sole cost, shall have full and complete responsibility and control over the filing, prosecution, and maintenance of all Assigned RNAi Patents. Novartis shall have full and complete responsibility and control over the filing, prosecution, and maintenance of all Licensed RNAi Patents, with expenses for such prosecution and maintenance to be shared equally by Arrowhead and Novartis.

(b) The prosecution and maintenance of the Licensed RNAi Patents will be through a mutually selected patent counsel. Within sixty (60) days following the Effective Date, the Parties shall agree on a patent counsel ("**Joint Counsel**") who will be engaged by both Parties. Novartis and Arrowhead shall be jointly and equally responsible for all fees and costs charged by Joint Counsel with respect to the prosecution and maintenance of Licensed RNAi Patents, and all other mutually agreed and approved out-of-pocket costs and expenses incurred by either Party in connection with such prosecution and maintenance thereof. Joint Counsel will give each Party's designee an opportunity to review the text of any patent applications, office action responses or other substantive documents for Licensed RNAi Patents before filing with any patent office or similar authority, shall incorporate each Party's designee's reasonable comments with respect thereto, and shall supply each Party's designee with a copy of each of said documents as filed, together with notice of filing dates and serial numbers. In the event that either Party provides Joint Counsel with conflicting instructions regarding any matter relating to Licensed RNAi Patents, Joint Counsel shall make the Parties aware of such conflicting instructions and, if the Parties are not able to resolve such conflict within a reasonable time prior to the applicable filing deadline, Novartis shall have the final say as regards the preparation, filing, prosecution and maintenance of Licensed RNAi Patents, acting reasonably and in good faith with respect to protecting Arrowhead's rights in and to the Licensed RNAi Patents.

(c) Both Parties shall reasonably cooperate with Joint Counsel in preparation, filing, prosecution and maintenance of patent applications for Licensed RNAi Patents, including providing Joint Counsel with data and other information as reasonably appropriate with respect thereto.

(d) Joint Counsel shall be instructed to keep each Party advised of the status of the prosecution and maintenance of Licensed RNAi Patents, including actual and prospective patent filings for patents, and shall provide each Party with advance copies of any papers related thereto. Joint Counsel shall also be instructed to promptly give notice to each Party of the grant, lapse, revocation, surrender, invalidation, or abandonment of any Licensed RNAi Patents.

(e) Should Novartis decide that it does not wish to continue paying for the prosecution and maintenance of a particular patent within the Licensed RNAi Patents, Novartis shall notify Arrowhead and Joint Counsel at least sixty (60) days in advance of the next deadline applicable thereto and shall allow Arrowhead to assume responsibility for such prosecution and maintenance payments incurred thirty (30) days after receipt of Novartis's notice. If Arrowhead assumes such responsibility, then Arrowhead may designate any counsel of its choice to handle the prosecution and maintenance of such patent and such patent shall no longer be treated as Novartis RNAi IP for purposes of any royalty obligations under this Agreement. If Arrowhead decides not to assume such responsibility, then it shall so instruct Novartis and Joint Counsel.

Section 2.08. *IP Enforcement*. With respect to any actual or potential infringements of any Licensed RNAi IP in the RNAi Field by a Third Party, Arrowhead shall have the exclusive right, but not the obligation, to prosecute at its own expense any action or proceeding with respect to such infringements and, with respect to any actual or potential infringements of Licensed RNAi IP outside of the RNAi Field by a Third Party, Novartis shall have the exclusive right, but not the obligation, to prosecute at its own expense any action or proceeding with respect to such infringements (Arrowhead or Novartis, in prosecuting any such action or proceeding in accordance with the foregoing, is referred to as the "**Enforcing Party**"). Any recoveries resulting from enforcement actions under this Section 2.08 shall first be applied against payment of each Party's costs and expenses in connection therewith. Any such recoveries in excess of such costs and expenses (the "**Remainder**") shall be shared by the Parties as follows: (a) if Arrowhead initiates such action or proceeding, then such Remainder shall be treated as Net Sales and will be subject to the payment obligations to Novartis under Article 6 (and for purposes of calculating the applicable royalty rate and commercial milestones, such Remainder will be combined with any Net Sales for such calendar year), with Arrowhead retaining the balance after such payment; or (b) if Novartis initiates such action or proceeding, the Remainder shall be divided equally between the Parties. In furtherance of Enforcing Party's enforcement rights, the other Party (the "**Joined Party**") hereby agrees that the Enforcing Party may include the Joined Party as a party plaintiff in any such action or proceeding if such joinder is deemed by the Enforcing Party to be necessary to commence or maintain any action or proceeding with respect to infringement of Licensed RNAi IP. Each Enforcing Party agrees to reasonably consult with the other Party on positions taken or statements made in any such action or proceeding relating to the scope, validity and/or infringement of claims within the Licensed RNAi IP. No settlement, consent judgment or other voluntary final disposition of the suit may be entered into in any such action or proceeding without the consent of the Joined Party, which consent shall not unreasonably be withheld.

Section 2.09. *Legends;* Registration of Shares.

(a) Except as set forth below, each certificate or book entry notation representing the Shares issued to Novartis shall bear a legend in substantially the following form:

> THE SECURITIES REPRESENTED BY THIS INSTRUMENT HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), OR ANY STATE SECURITIES LAWS, AND NO SALE, ASSIGNMENT, PLEDGE, HYPOTHECATION, GIFT, TRANSFER OR OTHER DISPOSITION OR OFFER TO DO ANY OF THE FOREGOING MAY BE MADE UNLESS A REGISTRATION STATEMENT UNDER THE SECURITIES ACT AND OTHER APPLICABLE SECURITIES LAWS WITH RESPECT TO SUCH SECURITIES IS THEN IN EFFECT, OR IN THE OPINION OF COUNSEL, ACCEPTABLE TO THE ISSUER, SUCH REGISTRATION UNDER THE SECURITIES ACT AND OTHER APPLICABLE SECURITIES LAWS IS NOT REQUIRED.

(b) As promptly as practicable (and in any event, within 10 days) after the Closing, Arrowhead will prepare and file a Registration Statement on Form S-3 providing for the registration of the resale of the Shares by Novartis (the "**Resale Registration Statement**"), with the number of Shares so registered being calculated using an assumed stock price equal to the stock price utilized in fixing the number of shares issuable under Section 2.03(b) (the "Assumed Share Price"). Arrowhead will cause the Resale Registration Statement to be declared effective within [***] days from Closing or, in the event that the Staff of the Securities and Exchange Commission selects the Resale Registration Statement for review, then it shall be declared effective within [***] days from Closing. Upon the effectiveness of the Resale Registration Statement, Novartis may request the removal of the foregoing legend, as set forth in Section 5.06.

(c) In preparing and filing the Resale Registration Statement, Novartis shall provide such selling stockholder information, including beneficial ownership of other shares of Arrowhead capital stock, as may be reasonably requested by Arrowhead. In the event that additional Shares are issued pursuant to Section 2.03 at an average price below the Assumed Share Price such that there becomes an insufficient number of Shares registered under the Resale Registration Statement, then Arrowhead shall, within [***] days following issuance of such excess number of Shares, file one or more additional resale registration statements on Form S-3 (or other equivalent form) covering the resale of such additional Shares; provided, however, that Arrowhead shall not be required to file any such additional registration statement(s) if such additional Shares would then be eligible for resale under Rule 144 (defined below) without volume limitations.

ARTICLE 3
REPRESENTATIONS AND WARRANTIES OF NOVARTIS

Except as set forth in the Novartis Disclosure Schedule, Novartis represents and warrants to Arrowhead as of the date hereof that:

Section 3.01. *Corporate Authorization*. The execution, delivery and performance by Novartis of the Transaction Documents to which it is a party and the consummation of the transactions contemplated hereby and thereby are within Novartis's corporate powers and have been duly authorized by all necessary corporate action on the part of Novartis. Each Transaction Document to which Novartis is a party constitutes a valid and binding agreement of Novartis.

Section 3.02. *Governmental Authorization*. The execution, delivery and performance by Novartis of the Transaction Documents to which it is a party and the consummation of the transactions contemplated hereby and thereby require no action by or in respect of, or filing with, any Governmental Authority other than: (i) compliance with the applicable requirements of the 1933 Act, the 1934 Act and any other federal or state securities laws and (ii) any such action or filing as to which the failure to make or obtain would not have a material adverse effect on the ability of Novartis to consummate the transactions contemplated hereunder.

Section 3.03. *Non-contravention*. The execution, delivery and performance by Novartis of the Transaction Documents to which it is a party and the consummation of the transactions contemplated hereby and thereby do not and will not (i) violate the certificate of incorporation or bylaws of Novartis, (ii) assuming compliance with the matters referred to in Section 3.02, violate any Applicable Law, (iii) require any consent or other action by any Person under, constitute a default under, or give rise to any Assignment Prohibition or right of termination, cancellation or acceleration of any right or obligation of Novartis or to a loss of any benefit to which Novartis is entitled under any provision of any agreement or other instrument binding upon Novartis or (iv) result in the creation or imposition of any material Lien on any Acquired RNAi Assets or Licensed RNAi IP, except in the case of each of clauses (ii) and (iii), as would not have, individually or in the aggregate, a material adverse effect on the ability of Novartis to consummate the transactions contemplated hereunder.

Section 3.04. *Assigned Licenses*. Each Assigned License is a valid and binding agreement of Novartis and is in full force and effect, no royalties, milestone payments, or other fees are due and payable with respect to any Assigned License, and neither Novartis nor, to the knowledge of Novartis, any Third Party thereto is in default or breach in any respect under the terms of any such Assigned License, except for any such defaults or breaches which would not have a material adverse effect on the ability of Novartis to consummate the transactions contemplated hereunder. Other than as listed in Section 3.04 of the Novartis Disclosure Schedule, Novartis has not received any written notice under any of the Assigned Licenses asserting that there has been or that there is likely to occur a breach or default under such Assigned Licenses. Set forth in Section 3.04 of the Novartis Disclosure Schedule is: (a) a complete and accurate list of: (i) all targets which would give rise to "Collaboration Products" (as defined the Novartis-Alnylam Agreement), and (ii) all targets which would give rise to "Adopted Products" (as defined in the Novartis-Alnylam Agreement), in each case as of the Effective Date, and (b) a complete and accurate list of all written amendments, waivers, and other agreements affecting the rights of either party under each of the Assigned Licenses.

Section 3.05. *Litigation*. There is no action, suit, investigation, claim, arbitration or proceeding pending against, or to the knowledge of Novartis, threatened against or affecting in any material respect the Acquired RNAi Assets, the Licensed RNAi IP, or the consummation of the transactions contemplated hereby, nor are there any facts or circumstances to the knowledge of Novartis that would be reasonably expected to give rise to any such action, suit, investigation, claim, arbitration or proceeding.

Section 3.06. *Intellectual Property*. (a) The RNAi IP constitutes all material Intellectual Property Rights that are owned or Controlled by Novartis or any of its Affiliates that are necessary for or that relate specifically to the Novartis RNAi Business or the RNAi Field. The Assigned RNAi IP constitutes all material Intellectual Property Rights that are owned by Novartis or any of its Affiliates and that relate exclusively to the RNAi Field. The Licensed RNAi IP includes all material Intellectual Property Rights that are owned or Controlled by Novartis or any of its Affiliates and that are necessary for or that relate specifically to the Novartis RNAi Business or relate specifically to the RNAi Field, in each case, other than the Assigned RNAi IP or any Intellectual Property Rights licensed to Novartis or its Affiliates under any of the Assigned Licenses. The Assigned Licenses constitute all of the material agreements to which Novartis or any of its Affiliates are a party and under which Intellectual Property Rights owned by a Third Party that relate exclusively to the Novartis RNAi Business or relate exclusively to the RNAi Field.

(b) Section 3.06(b) of the Novartis Disclosure Schedule contains a true, correct and complete list of all Patents Rights (including patent applications), registered Trademarks and applications for registration of Trademarks, registered copyrights and applications for registration of copyrights, and internet domain names owned by Novartis or any of its Affiliates and included in the Novartis RNAi IP (the "**RNAi Business Registered IP**"). The RNAi Business Registered IP is subsisting and, to the knowledge of Novartis, valid and enforceable and has been prosecuted or obtained in accordance with Applicable Law, including with respect to inventorship. All patent applications included in the RNAi Business Registered IP have been prosecuted in compliance with Applicable Law and are true and correct in all material respects. To the knowledge of Novartis, no prior acts or omissions of Novartis or any of its Affiliates or representatives will result in the invalidation of or will render unenforceable, in either case, in whole or in part, any issued patent included in the RNAi Business Registered IP or that issues on any patent application included in the RNAi Business Registered IP. To the knowledge of Novartis, all relevant prior art has been cited to the applicable Governmental Authority during the course of prosecution of all patent applications included in the RNAi Business Registered IP to the extent required by Applicable Laws for such prosecution. All Applicable Laws regarding the duty of disclosure, candor and good faith have been complied with in connection with the filing and prosecution of each such patent application. All filing, issue, registration, renewal, maintenance, extension or other official registry fees for the RNAi Business Registered IP currently due have been paid. Section 3.06(b) of the Novartis Disclosure Schedule sets forth a true and complete list of all such filing, issue, registration, renewal, maintenance, extension or other official registry fees for the RNAi IP included in the Assigned RNAi IP and all actions and filings with respect to such Assigned RNAi IP that are required to be taken or made within one hundred twenty (120) days after the Effective Date to maintain or continue the prosecution of each item of such Assigned RNAi IP. No RNAi Business Registered IP is the subject of any pending interference, derivation, reissue, reexamination, opposition or cancellation, invalidity or post-grant proceeding and, to the knowledge of Novartis, none of the aforementioned proceedings is or has been threatened.

(c) Novartis exclusively owns all right, title and interest in and to all Novartis RNAi IP free and clear of all Liens, except for PAT903839-US-PSP, PAT903839-US-NP, and PAT903839-US-DIV, which are co-owned with Thermo Fisher Scientific Inc. Neither Novartis, any of its Affiliates, nor any predecessor owner of any item of any Novartis RNAi IP has granted any license, option or other right to any Novartis RNAi IP or agreed in any material agreement to any restrictions on the use, exploitation, assertion, procurement or enforcement of any Novartis RNAi IP in any material respect.

(d) Except as set forth on Section 3.06(d) of the Novartis Disclosure Schedule, there are no legal actions or proceedings of any nature pending or, to the knowledge of Novartis, threatened against Novartis or any of its Affiliates challenging or contesting the validity, use, inventorship, ownership, enforceability, patentability or registrability of any of the Novartis RNAi IP or in which it is alleged that Novartis or any of its Affiliates have infringed, misappropriated or violated or are infringing, misappropriating or violating any Intellectual Property Rights of any Third Party. Novartis and its Affiliates have not received any written or email communication in the prior three years in relation to the Novartis RNAi Business alleging that Novartis has infringed, misappropriated or violated or are infringing, misappropriating or violating any Intellectual Property Rights of any Third Party or inviting Novartis or any of its Affiliates to take a license under any Patent Rights owned by a Third Party.

(e) To the knowledge of Novartis, the Novartis RNAi Business as conducted prior to the Closing has not infringed, misappropriated or violated any Intellectual Property Rights of any Third Party in any material respect, and Novartis has received no written notice of any such infringement, misappropriation or violation. To the knowledge of Novartis, no Third Party is infringing or misappropriating any Novartis RNAi IP.

(f) To the knowledge of Novartis, all current and former employees, consultants and independent contractors of Novartis or any its Affiliates who have contributed to the creation or development of any Novartis RNAi IP or other Intellectual Property Rights developed for Novartis or any of its Affiliates that are used or contemplated to be used in the conduct of the Novartis RNAi Business have executed and delivered to Novartis or the applicable Affiliate written agreements pursuant to which such individuals have assigned to Novartis or the applicable Affiliate all their rights and interest in and to all Intellectual Property Rights they may have conceived, reduced to practice, created or otherwise developed in the course of their employment or engagement with Novartis or the applicable Affiliate, and, to the knowledge of Novartis, no party thereto is in breach or default of any such agreement. To the knowledge of Novartis, no director, officer, stockholder, employee, consultant, contractor, agent or other representative of Novartis or any of its Affiliates owns or claims any rights in (nor has any of them filed an application claiming any rights in) any Novartis RNAi IP.

(g) The consummation of the transactions contemplated by this Agreement will not materially adversely affect any of Novartis' rights to any of the RNAi IP, and all such RNAi IP will be owned or licensed to Arrowhead on identical terms and conditions immediately subsequent to the consummation of the transactions contemplated by this Agreement, without the payment of any additional consideration (other than as provided in this Agreement) in connection therewith. Neither the execution, delivery or performance of this Agreement nor the consummation of the transactions contemplated by this Agreement will, with or without notice or the lapse of time, result in or give any Third Party the right or option to cause or assert that: (i) Arrowhead or any of its Affiliates granting to any Third Party any rights with respect to Intellectual Property Rights or (ii) Arrowhead or any of its Affiliates being bound by, or subject to, any non-compete or other restriction on the operation or scope of their respective businesses.

(h) Novartis and its Affiliates have taken reasonable steps to maintain the confidentiality of and otherwise protect and enforce their rights in all trade secrets and other confidential Information included in the RNAi IP, such Information has not been disclosed by Novartis, its Affiliates, or, to the knowledge of Novartis, any other Person, except pursuant to legally-binding confidentiality undertakings.

(i) The Novartis RNAi IP is not subject to any outstanding injunction, judgment, order, decree, or court ruling that limits, restricts or otherwise adversely affects the use or commercial exploitation thereof.

Section 3.07. *Finders' Fees*. There is no investment banker, broker, finder or other intermediary that has been retained by or is authorized to act on behalf of Novartis who might be entitled to any fee or commission in connection with the transactions contemplated by this Agreement.

Section 3.08. *Accredited Investor; Purchase for Investment*. (a) Novartis is an "accredited investor" as that term is defined in Rule 501(a) of Regulation D, promulgated under the 1933 Act.

(b) Novartis is acquiring the Shares hereunder for investment for its own account and not with a view to, or for sale in connection with, any distribution thereof. Novartis (either alone or together with its advisors) has sufficient knowledge and experience in financial and business matters so as to be capable of evaluating the merits and risks of such investment in the Shares and is capable of bearing the economic risks of such investment.

Section 3.09. *Transfer of Entire Business.* The consummation of the transactions contemplated by this Agreement will affect a sale or transfer of all or substantially all of the Novartis RNAi Business.

Section 3.10. *No Other Representations*. Except as expressly set forth in this Agreement, Novartis disclaims any express or implied representations or warranties of any nature relating to Novartis, its Affiliates, the Acquired RNAi Assets and the Licensed RNAi IP.

ARTICLE 4
REPRESENTATIONS AND WARRANTIES OF ARROWHEAD

Except as set forth in the Arrowhead Disclosure Schedule or the Arrowhead SEC Documents filed before the Effective Date, Arrowhead represents and warrants to Novartis as of the date hereof that:

Section 4.01. *Corporate Existence and Power*. Arrowhead is a corporation duly incorporated, validly existing and in good standing under the laws of Delaware and has all corporate powers and all material governmental licenses, authorizations, permits, consents and approvals required to carry on its business as now conducted, except for those licenses, authorizations, permits, consents and approvals the absence of which would not have an Arrowhead Material Adverse Effect. Arrowhead is duly qualified to do business as a foreign corporation and is in good standing in each jurisdiction where such qualification is necessary, except for those jurisdictions where failure to be so qualified would not, individually or in the aggregate, have an Arrowhead Material Adverse Effect.

Section 4.02. *Corporate Authorization*. The execution, delivery and performance by Arrowhead of the Transaction Documents and the consummation of the transactions contemplated hereby and thereby are within Arrowhead's corporate powers and have been duly authorized by all necessary corporate action on the part of Arrowhead. Each Transaction Document to which Arrowhead is a party constitutes a valid and binding agreement of Arrowhead.

Section 4.03. *Governmental Authorization*. The execution, delivery and performance by Arrowhead of the Transaction Documents to which it is a party and the consummation of the transactions contemplated hereby and thereby require no material action by or in respect of, or filing with, any Governmental Authority other than: (i) compliance with the applicable requirements of the 1933 Act, the 1934 Act and any other federal or state securities laws, (ii) compliance with the applicable requirements of the NASDAQ Global Market and (iii) any such action or filing as to which the failure to make or obtain would not have an Arrowhead Material Adverse Effect.

Section 4.04. *Non-contravention*. The execution, delivery and performance by Arrowhead of the Transaction Documents to which it is a party and the consummation of the transactions contemplated hereby and thereby do not and will not (i) violate the certificate of incorporation or bylaws of Arrowhead, (ii) assuming compliance with the matters referred to in Section 4.03, violate any Applicable Law (iii) require any consent or other action by any Person under, constitute a default under, or give rise to any right of termination, cancellation or acceleration of any right or obligation of Arrowhead or to a loss of any benefit to which Arrowhead is entitled under any provision of any agreement or other instrument binding upon Arrowhead or (iv) result in the creation or imposition of any material Lien on any asset of Arrowhead, with such exceptions, in the case of each of clauses (ii) and (iii), as would not have, individually or in the aggregate, an Arrowhead Material Adverse Effect.

Section 4.05. *Financing*. Arrowhead has sufficient cash, available lines of credit or other sources of immediately available funds to enable it to pay the Purchase Price and any other amounts to be paid by it hereunder.

Section 4.06. *Arrowhead Stock*. The Shares delivered pursuant to Section 2.03 will be, when issued, duly authorized, validly issued, fully paid and non-assessable. The issuance thereof is not subject to any preemptive or other similar right.

Section 4.07. *Capitalization*. The authorized capital stock of Arrowhead is as set forth in the Arrowhead SEC Documents. All outstanding shares of capital stock of Arrowhead have been duly authorized and validly issued and are fully paid and non-assessable, and all shares of capital stock of Arrowhead that may be issued pursuant to any compensatory stock option or other compensation plan or arrangement will be, when issued, duly authorized and validly issued, fully paid and non-assessable and free of preemptive rights.

Section 4.08. *Arrowhead Subsidiaries*. Each Arrowhead Subsidiary is an entity duly organized, validly existing and (where applicable) in good standing under the laws of its jurisdiction of formation and has all company powers and all governmental licenses, authorizations, permits, consents and approvals required to carry on its business as now conducted, except for those licenses, authorizations, consents and approvals the absence of which would not have an Arrowhead Material Adverse Effect. Section 4.08 of the Arrowhead Disclosure Schedule identifies all material Arrowhead Subsidiaries and their respective jurisdictions of organization. Except for the capital stock or other voting securities of, or ownership interests in, the Arrowhead Subsidiaries, Arrowhead does not own, directly or indirectly, any capital stock or other voting securities of, or ownership interests in, any Person.

Section 4.09. *SEC Filings*. (a) Arrowhead has filed with or furnished to the Securities and Exchange Commission all reports, schedules, forms, statements, prospectuses, registration statements and other documents required to be filed or furnished by Arrowhead since October 1, 2014 (collectively, together with any exhibits and schedules thereto and other information incorporated therein, the "**Arrowhead SEC Documents**").

(b) As of its filing date (or, if amended or superseded by a filing prior to the date hereof, on the date of such filing), each Arrowhead SEC Document filed pursuant to the 1934 Act did not contain any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements made therein, in the light of the circumstances under which they were made, not misleading.

(c) Each Arrowhead SEC Document that is a registration statement, as amended or supplemented, if applicable, filed pursuant to the 1933 Act, as of the date such registration statement or amendment became effective, did not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein not misleading.

(d) Arrowhead has established and maintains disclosure controls and procedures (as defined in Rule 13a-15 under the 1934 Act). Such disclosure controls and procedures are designed to ensure that material information relating to Arrowhead, including the Arrowhead Subsidiaries, is made known to Arrowhead's principal executive officer and its principal financial officer by others within those entities, particularly during the periods in which the periodic reports required under the 1934 Act are being prepared. Such disclosure controls and procedures are effective in timely alerting Arrowhead's principal executive officer and principal financial officer to material information required to be included in Arrowhead's periodic and current reports required under the 1934 Act.

(e) Arrowhead and the Arrowhead Subsidiaries have established and maintained a system of internal controls over financial reporting (as defined in Rule 13a-15 under the 1934 Act) sufficient to provide reasonable assurance regarding the reliability of Arrowhead's financial reporting and the preparation of Arrowhead's financial statements for external purposes in accordance with GAAP. Since October 1, 2014, there have not been any (i) significant deficiencies or material weaknesses in the design or operation of internal controls which are or were reasonably likely to adversely affect Arrowhead's ability to record, process, summarize and report financial information or (ii) fraud, whether or not material, that involved management or other employees who have or had a significant role in Arrowhead's and the Arrowhead Subsidiaries' internal controls.

(f) Since October 1, 2014, Arrowhead has complied in all material respects with the applicable listing and corporate governance rules and regulations of the NASDAQ Global Market.

(g) Each of the principal executive officer and principal financial officer of Arrowhead (or each former principal executive officer and principal financial officer of Arrowhead, as applicable) have made all certifications required by Rule 13a-14 and 15d-14 under the 1934 Act and Sections 302 and 906 of the Sarbanes-Oxley Act of 2002 and any related rules and regulations promulgated by the Securities and Exchange Commission and the NASDAQ Capital Market, and the statements contained in any such certifications are complete and correct.

Section 4.10. *Arrowhead Financial Statements*. The audited consolidated financial statements and unaudited consolidated interim financial statements of Arrowhead included or incorporated by reference in the Arrowhead SEC Documents fairly present in all material respects, in conformity with GAAP applied on a consistent basis (except as may be indicated in the notes thereto), the consolidated financial position of Arrowhead and its consolidated Arrowhead Subsidiaries as of the dates thereof and their consolidated results of operations and cash flows for the periods then ended (subject to normal year-end audit adjustments in the case of unaudited financial statements).

Section 4.11. *Absence of Certain Changes*. Since October 1, 2014, the business of Arrowhead and the Arrowhead Subsidiaries has been conducted in the ordinary course consistent with past practices and there has not been any event, occurrence, development or state of circumstances or facts that has had or would reasonably be expected to have, individually or in the aggregate, an Arrowhead Material Adverse Effect.

Section 4.12. *No Undisclosed Material Liabilities*. There are no liabilities of Arrowhead or any Arrowhead Subsidiary of any kind that are required under GAAP to be recorded as liabilities on the balance sheet of Arrowhead or any Arrowhead Subsidiary, other than:

(a) liabilities provided for in Arrowhead's most recent audited consolidated balance sheet included in a Arrowhead SEC Document prior to the date hereof or in the notes thereto;

(b) liabilities incurred in the ordinary course of business of Arrowhead and the Arrowhead Subsidiaries consistent with past practices since the date of Arrowhead's most recent audited consolidated balance sheet included in a Arrowhead SEC Document prior to the date hereof;

(c) liabilities disclosed on Schedule 4.12;

(d) liabilities disclosed in, related to or arising under any agreements, instruments or other matters disclosed by Arrowhead in this Agreement or the Arrowhead Disclosure Schedule; or

(e) other undisclosed liabilities which, individually or in the aggregate, are not material to Arrowhead and the Arrowhead Subsidiaries, taken as a whole.

Section 4.13. *Litigation*. There is no action, suit, investigation or proceeding pending against, or to the knowledge of Arrowhead threatened against or affecting, Arrowhead or any Arrowhead Subsidiary or any of their respective properties before any arbitrator or any Governmental Authority which is reasonably likely to have an Arrowhead Material Adverse Effect or which in any manner challenges or seeks to prevent, enjoin, alter or materially delay the transactions contemplated by this Agreement.

Section 4.14. *Compliance with Laws and Court Orders*. Neither Arrowhead nor any Arrowhead Subsidiary is in violation of any Applicable Law, except for violations that have not had and would not reasonably be expected to have, individually or in the aggregate, an Arrowhead Material Adverse Effect.

Section 4.15. *Taxes*. (a) All federal income Tax Returns and all other material Tax Returns required to be filed with any Taxing Authority on or before the Effective Date by, or with respect to, Arrowhead have been duly and timely filed on or before the Effective Date, and such Tax Returns were accurate in all material respects;

(b) Arrowhead has timely paid all material Taxes (whether or not shown as due and payable on any Tax Return) owed by Arrowhead, including Taxes required to be withheld from amounts owing to any employee, creditor, shareholder or other Third Party;

(c) The charges, accruals and reserves for Taxes with respect to Arrowhead reflected on the books of Arrowhead (excluding any reserve for deferred Taxes established to reflect timing differences between book and Tax income) are adequate to cover material Tax liabilities accruing through the end of the last period for which Arrowhead ordinarily records items on its books; and

(d) To Arrowhead's knowledge, there is no action, suit, proceeding, investigation, audit or claim pending or proposed in writing, threatened or pending against or with respect to the Arrowhead in respect of any material Tax.

Section 4.16. *Antitakeover Statutes*. No antitakeover, "control share acquisition," "fair price," "moratorium" or other antitakeover laws enacted under Applicable Law apply to Novartis's acquisition of the Shares hereunder.

Section 4.17. *Finders' Fees*. There is no investment banker, broker, finder or other intermediary that has been retained by or is authorized to act on behalf of Arrowhead who might be entitled to any fee or commission in connection with the transactions contemplated by this Agreement.

Section 4.18. *Independent Investigation.* Arrowhead has conducted its own independent investigation, review and analysis of the Novartis RNAi Business, the Acquired RNAi Assets and the Licensed RNAi IP, and acknowledges that it has been provided adequate access to the personnel, properties, assets, premises, books and records, and other documents and data of Novartis for such purpose. Arrowhead acknowledges and agrees that: (a) in making its decision to enter into this Agreement and to consummate the transactions contemplated hereby, Arrowhead has relied solely upon its own investigation and the express representations and warranties of Novartis set forth in Article 3 of this Agreement (including related portions of the Novartis Disclosure Schedules); and (b) neither Novartis nor its Affiliates, nor any other Person has made any representation or warranty as to Novartis, the Novartis RNAi Business, the Acquired RNAi Assets, the Licensed RNAi IP or this Agreement, except as expressly set forth in Article 3 of this Agreement (including the related portions of the Novartis Disclosure Schedules).

Section 4.19. *No Other Representations*. Except as expressly set forth in this Agreement, Arrowhead disclaims any express or implied representations or warranties of any nature relating to Arrowhead or the Arrowhead Stock.

ARTICLE 5
CERTAIN COVENANTS OF ARROWHEAD AND NOVARTIS

Arrowhead and Novartis agree that:

Section 5.01. *Commercially Reasonable Efforts; Further Assurances*. Subject to the terms and conditions of this Agreement and each other Transaction Document, Arrowhead and Novartis will use their commercially reasonable efforts to take, or cause to be taken, all actions and to do, or cause to be done, all things necessary or desirable under Applicable Law to consummate the transactions contemplated by this Agreement and the other Transaction Documents.

Section 5.02. *Public Announcements*. The Parties agree to consult with each other before issuing any press release or making any public statement with respect to this Agreement or any other Transaction Document or the transactions contemplated hereby or thereby and, except for any press releases and public announcements the making of which may be required by Applicable Law or any listing agreement with any national securities exchange, will not issue any such press release or make any such public statement without the consent of the other Party.

Section 5.03. *Arrowhead Access to Information*. Novartis will deliver to Arrowhead (i) within [***] ([***]) days after the Closing, any Assigned RNAi Books and Records, (ii) within [***] ([***]) days after the Closing, copies of those portions of any Novartis RNAi group laboratory notebooks and other tangible media in the possession or under the control of Novartis to the extent the same contains Information that is included in the Licensed RNAi IP of Novartis and which is related to the Initial Targets, (iii) within [***] ([***]) days after the Closing, copies of those portions of any Novartis laboratory notebooks and other tangible media in the possession or under the control of Novartis to the extent the same contains Information that is included in the Licensed RNAi IP of Novartis and which does not relate to Initial Targets; and (iv) within [***] ([***]) days after the Closing, copies (in CD ROM or comparable format) of all documents in the electronic data room that Novartis made available to Arrowhead; provided that Novartis shall be entitled to maintain copies of any materials referred to in each of clauses (i), (ii), (iii) and (iv) (and, in the event Novartis has not made any such copies before delivering such materials to Arrowhead, Arrowhead shall provide Novartis with "pdf" copies of such materials within [***] days of Arrowhead's receipt thereof), which materials shall be subject to the confidentiality obligations set forth in Section 5.04; and provided further that, in the event that any Information that is not relevant to the RNAi Field is inadvertently disclosed to Arrowhead pursuant to this Section 5.03, Arrowhead covenants and agrees that it shall not use such Information for any purpose. From and after the Effective Date, Novartis will afford promptly to Arrowhead and its agents reasonable access to its books of account, financial and other records (including accountant's work papers), information, employees and auditors to the extent necessary or useful for Arrowhead in connection with any audit, investigation, dispute or litigation or any other reasonable business purpose relating to the Assigned RNAi IP; provided that any such access by Arrowhead shall not unreasonably interfere with the conduct of the business of Novartis. Notwithstanding anything to the contrary contained herein, nothing in this Section 5.03 shall require (i) Novartis or any of its Affiliates to violate any Applicable Law or a contract or obligation of confidentiality owing to a Third Party or waive the protection of an attorney-client privilege or (ii) the auditors and independent accountants of Novartis or any of its Affiliates to make any work papers available to any Person unless and until such Person has signed a customary confidentiality and hold harmless agreement relating to such access to work papers in form and substance reasonably acceptable to such auditors or independent accountants. Arrowhead shall bear all of the out-of-pocket costs and expenses (including attorneys' fees, but excluding reimbursement for general overhead, salaries and employee benefits) reasonably incurred in connection with the foregoing.

Section 5.04. *Novartis Access to Information; Cooperation on Certain Matters*. From and after the Effective Date, Arrowhead shall permit Novartis to make and maintain, solely for archival purposes, copies of any laboratory notebooks or other materials delivered to Arrowhead to the extent they contain the Assigned RNAi IP; provided that any such access by Novartis shall not unreasonably interfere with the conduct of the business of Arrowhead and shall not grant Novartis any proprietary rights to own or use the information contained therein. Notwithstanding anything to the contrary contained herein, nothing in this Section 5.04 shall require Arrowhead or any of its Affiliates to violate any Applicable Law or a contract or obligation of confidentiality owing to a Third Party or waive the protection of an attorney-client privilege. Novartis will hold, and will use its best efforts to cause its respective officers, directors, employees, accountants, counsel, consultants, advisors and agents to hold, in confidence, unless compelled to disclose by judicial or administrative process or by other requirements of Applicable Law, all confidential documents and information concerning the Novartis RNAi IP provided to it pursuant to this Section. Novartis shall bear all of the out-of-pocket costs and expenses (including attorneys' fees, but excluding reimbursement for general overhead, salaries and employee benefits) reasonably incurred in connection with the foregoing.

Section 5.05. *Listing of Arrowhead Stock*. Arrowhead shall take all necessary action to cause the Shares (subject to the limits set forth in Section 2.04) to be listed on the NASDAQ Global Market promptly following the Closing (but no later than [***] days thereafter).

Section 5.06. *Legend Removal*. Certificates or book entry notations (as applicable) evidencing the Shares shall not contain any legend (including the legend set forth in Section 2.09): (i) while a registration statement covering the resale of the Shares (which may include the Resale Registration Statement) is effective under the 1933 Act, (ii) following any sale of the Shares pursuant to Rule 144 under the 1933 Act ("**Rule 144**"), (iii) if Shares are eligible for sale under Rule 144, without the requirement for Arrowhead to be in compliance with the current public information required under Rule 144 as to such Shares and without volume or manner-of-sale restrictions, or (iv) if such legend is not required under applicable requirements of the 1933 Act. Upon request by Novartis, following such time as a legend is no longer required under this Section 5.06, Arrowhead shall cause its counsel to issue a legal opinion to its transfer agent to effect the removal of the legend hereunder from any Shares. Arrowhead agrees that following such time as a legend is no longer required under this Section 5.06, it will, following the delivery by Novartis to Arrowhead or its transfer agent of a certificate representing the Shares (if issued in certificated form), deliver or cause to be delivered to Novartis a certificate representing such shares that is free from all restrictive and other legends. In removing the legend set forth in Section 2.09, Novartis undertakes and covenants that it will only sell the underlying Shares pursuant to the Resale Registration Statement or pursuant to Rule 144, when and as permitted thereunder.

Section 5.07. *Notices of Certain Events*. Each Party shall promptly notify the other of:

(a) any notice or other communication from any Person alleging that the consent of such Person is or may be required in connection with the transactions contemplated by this Agreement or any other Transaction Document; or

(b) any notice or other communication from any Governmental Authority in connection with the transactions contemplated by this Agreement or any other Transaction Document.

Section 5.08. *Patent Service Providers*. Within [***] days after the Closing, Novartis agrees to deliver a notice, with copy to Arrowhead, to each Third Party engaged on the date hereof by or on behalf of Novartis or any of its Affiliates with respect to the registration, protection of, prosecution and defense of claims related to any patents included in the Assigned RNAi Patents (each, a "**Patent Service Provider**"). Such notice shall inform the Patent Service Provider of the assignment of the applicable Assigned RNAi Patents hereunder and shall instruct the Patent Service Provider to cease any work relating thereto on behalf of Novartis or any of its Affiliates. For the avoidance of doubt, none of Novartis or any of their respective Affiliates shall have any liability or obligation hereunder with respect to (i) the continued engagement of any Patent Service Provider from and after the Closing or (ii) any fees or other charges of any Patent Service Provider incurred after the earlier of the [***]-day period following the Closing or the date of delivery of the notice contemplated in this Section to such Patent Service Provider.

Section 5.09. *Covenant Not to Challenge Patent Rights*. From and after the Closing, Novartis shall not, and shall cause its Affiliates not to, challenge or knowingly assist any Third Party in challenging the validity or enforceability of the Assigned RNAi Patents, except in connection with an action brought against Novartis or its Affiliates by Arrowhead, its Affiliates, sublicensees or successors in interest. From and after the Closing, Arrowhead shall not, and shall cause its Affiliates, sublicensees or successors in interest not to, challenge or knowingly assist any Third Party in challenging the validity or enforceability of the Licensed RNAi Patents, except in connection with an action brought against Arrowhead or its Affiliates by Novartis, its affiliates, sublicensees or successors in interest.

Section 5.10. *Further Assurances; Preservation of Privilege*. At the reasonable request of Arrowhead and at Arrowhead's expense, Novartis will execute and deliver such assignments and other documents and do and perform such other acts and things as Arrowhead may reasonably request to vest ownership of the Assigned RNAi IP in Arrowhead. To the extent any attorney-client privilege or the attorney work-product doctrine applies to any portion of the files delivered to Arrowhead pursuant to this Agreement, Novartis will ensure that, if any such portion of such files remains under Novartis's possession or control after the Closing, such files will not be disclosed to any Third Party unless (a) disclosure is ordered by a court of competent jurisdiction, after all appropriate appeals to prevent disclosure have been exhausted, and (b) Novartis has, to the extent legally permitted, given Arrowhead prompt notice upon learning that any Third Party sought or intended to seek a court order requiring the disclosure of any such portion of such files. To the extent that any conception and reduction to practice information is not provided as part of the files delivered pursuant to this Agreement, Novartis shall promptly respond to Arrowhead's requests for any such additional information that may exist, if needed by Arrowhead in connection with the prosecution and enforcement of the Assigned RNAi Patents. Novartis agrees to, and agrees to cause its Affiliates to, upon Arrowhead's written request and at Arrowhead's sole cost and expense, (i) disclose to Arrowhead all pertinent factual or other information and data (including disclosure of lab notebooks, reports, and similar information) reasonably available to such Person relating to the Assigned RNAi Patents, (ii) execute all applications, specifications, figures, sequence listings, oaths, declarations, affidavits, assignments and all other reasonable instruments relating to the Assigned RNAi Patents which Arrowhead or any of its Affiliate shall deem reasonably necessary, (iii) make factual witnesses to matters relating to the Assigned RNAi Patents available upon the reasonable request of Arrowhead and at its expense, and (iv) cooperate reasonably (including participation) in any legal action or proceeding related to the Assigned RNAi Patents.

Section 5.11. *Technology Transfer Assistance.*

(a) *Technology Transfer Plan*. Within a period of [***] ([***]) months following the Effective Date, Novartis shall complete the activities assigned to Novartis as set forth in the technology transfer plan attached hereto as Schedule 5.11(a) (as it may be amended from time to time by mutual agreement of the Parties, the "**Technology Transfer Plan**"), at no additional cost to Arrowhead, to effect the successful transfer to Arrowhead of the Novartis RNAi IP. Novartis shall make available to Arrowhead such number of technical personnel as may be set forth in the Technology Transfer Plan to answer any questions or provide instruction as reasonably requested by Arrowhead in connection with Arrowhead's discovery, development, commercialization, manufacture and use of the Novartis RNAi IP.

(b) *Management of Transition Activities*. Each Party shall designate a reasonably sufficient number of personnel who shall be responsible for coordinating the technology transfer activities under the Technology Transfer Plan. Each Party shall cooperate with the other Party in such other Party's conduct of technology transfer activities under the Technology Transfer Plan.

Section 5.12. *Material Transfer*. Novartis may possess certain materials associated with Novartis' RNAi activities that are useful for facilitating the rapid development of the Novartis RNAi IP by Arrowhead, which materials are set forth on Schedule 5.12 hereto (the "**Novartis Materials**"). Within a period of [***] ([***]) months following the Effective Date, Novartis shall complete the activities necessary to transfer the Novartis Materials in existence as of the Effective Date at no additional cost to Arrowhead.

Section 5.13. *Payment to Alnylam.* Novartis covenants and agrees to make timely payment of $[***] to Alnylam in accordance with Section 3(a)(1) of the February 27, 2015 amendment to the Novartis-Alnylam Agreement. Arrowhead covenants and agrees to make a payment of $[***] to Novartis if Arrowhead achieves the milestone event described in the first row of the table of Section 4.4(b) of the Novartis-Alnylam Agreement.

ARTICLE 6
EXCLUSIVE NEGOTATION RIGHTS; RIGHTS OF FIRST NEGOTIATION; DEVELOPMENT AND COMMMERCIALIZATION PAYMENTS AND REPORTS; DILIGENCE

Section 6.01. *Exclusive Negotiation Rights; Rights of First Negotiation.* (a) Prior to Initiation of a Phase 2 Clinical Trial for a given RNAi Product or Arrowhead RNAi Product directed to an Initial Target, Novartis shall have exclusive right to negotiate a license under any Intellectual Property Rights owned or exclusively licensed to Arrowhead to make, sell or otherwise commercially exploit such RNAi Product or Arrowhead RNAi Product. Arrowhead covenants and agrees that it shall not engage in any activities (a) that would interfere with Novartis' rights under this Section 6.01 or (b) [***]. In the event that Novartis is unable to exercise its rights under this Section 6.01 as a result of such activities, Arrowhead shall pay to Novartis the sum of $[***]. Notwithstanding the foregoing payment, Novartis shall be free to pursue any and all other remedies in connection with a breach of this covenant.

(b) After Initiation of a Phase 2 Clinical Trial for a given Arrowhead RNAi Product directed to an Initial Target (each, after such Initiation, a "**ROFN Candidate**"), Novartis shall have a right of first negotiation (the "**ROFN Rights**") if Arrowhead or any of its Affiliates proposes to Out-License any ROFN Candidate, subject to the limitations set forth in Section 6.01(f), or to enter into substantive discussions or negotiations with any Third Party relating to the Out-License of any such ROFN Candidate. Arrowhead shall give Novartis written notice thereof. Such notice shall include (i) a description in reasonable detail of the ROFN Candidate, including the status of its development and the status of any discussions with Regulatory Authorities relating thereto and (ii) the territory to which such Out-License would apply.

(c) Novartis shall have [***] days after receipt of a notice delivered pursuant to Section 6.01(b) to notify Arrowhead in writing that Novartis is interested in negotiating the applicable Out-License on commercially reasonable terms. If Novartis so notifies Arrowhead within this [***]-day period (such notice being an "**Opt-in Notice**"), Arrowhead shall as promptly as reasonably practicable thereafter provide Novartis with detailed information (including confidential information) regarding the applicable ROFN Candidate, including a summary of all biological, chemical and other ROFN Candidate data and an identification of all patents, Trademarks and/or other Intellectual Property Rights that are owned (wholly or partly), used or in-licensed by Arrowhead or its Affiliates and that are practiced by, arise from and/or otherwise relate to the ROFN Candidate and/or the manufacture or sale thereof (collectively, the "**Data Package**"). If Novartis does not timely provide an Opt-in Notice pursuant to this Section 6.01(c) with respect to a particular proposed Out-License, then, subject to Section 6.01(f), Arrowhead shall be free for a period of [***] months from the expiration of the [***]-day notice period to pursue that proposed Out-License with any Third Party. Novartis's ROFN Rights will be deemed to have lapsed unless Arrowhead has not consummated a licensing agreement for such Data Package within such [***] months of Novartis's decision.

(d) During the Term Sheet Period (defined below) with respect to any proposed Out-License, Arrowhead will negotiate exclusively and in good faith with Novartis regarding the applicable Out-License. During such Term Sheet Period, Arrowhead shall provide (or cause to be provided) such additional information regarding the applicable ROFN Candidate reasonably requested by Novartis that is in Arrowhead's possession or control, provided that Arrowhead shall not be required to perform any studies or expend any material funds to generate such information. Novartis shall have up to [***] days to review such additional information. During such Term Sheet Period, Novartis may (but is not required to) submit a proposal in the form of a written term sheet with respect to the definitive terms of such Out-License, including the consideration proposed to be paid in connection with such Out-License, (including, to the extent applicable, the amount of the upfront and deferred cash consideration and, to the extent that any portion of such cash consideration is to be subject to earn out obligations, milestones or other contingencies, the nature of such contingencies, the amount and term of any royalties and the amount of any research and development funding) and other material terms and conditions of such Out-License. The "**Term Sheet Period**" with respect to any proposed Out-License means that number of days following Novartis' receipt of the applicable Data Package equal to [***] days, less the number of days that elapsed between Novartis' receipt of Arrowhead's applicable notice delivered pursuant to Section 6.01(b) and Novartis' delivery of the applicable Opt-In Notice.

(e) Until the expiration of the Exclusivity Period with respect to a ROFN Candidate, Arrowhead shall not (and shall cause its Affiliates not to) negotiate, discuss or enter into any agreement with any Third Party with respect to any Out-License of such ROFN Candidate. The "**Exclusivity Period**" with respect to any ROFN Candidate means the period beginning on the date hereof and ending (i) if Novartis has not timely delivered an Opt-In Notice in accordance with Section 6.01(c), on the [***] day following Novartis' receipt of Arrowhead's notice delivered pursuant Section 6.01(b), or (ii) if Novartis has timely delivered an Opt-In Notice in accordance with Section 6.01(c), then at the end of the applicable Term Sheet Period; *provided* that the Exclusivity Period may be extended by mutual written agreement of the Parties.

(f) Following the Exclusivity Period with respect to any ROFN Candidate, Arrowhead and its Affiliates shall be entitled to negotiate and enter into a definitive agreement with respect to an Out-License of such ROFN Candidate with any Third Party; *provided* that (i) if Novartis has submitted a written term sheet to Arrowhead pursuant to Section 6.01(d) during the applicable Exclusivity Period, the terms of such Out-License with any Third Party may not be less favorable, on the whole, to Arrowhead or its applicable Affiliates than the terms last proposed by Novartis in any such term sheet delivered to Arrowhead during the Exclusivity Period; (ii) such Out-License must apply to the same territory identified in the applicable notice delivered by Arrowhead to Novartis pursuant to Section 6.01(b) and not to any broader territory; and (iii) if Arrowhead does not consummate an arrangement with a Third Party with respect to such Out-License within nine months after the end of the applicable Exclusivity Period, Arrowhead's right to negotiate with and enter into such Out-License with any Person other than Novartis shall terminate until Arrowhead has complied again with the procedures set forth in this Section 6.01.

(g) Novartis will hold, and will use Commercially Reasonable Efforts to cause its Affiliates, officers, directors, employees, accountants, counsel, consultants, advisors and agents to hold, in confidence (meaning that the applicable information will not be disclosed to any Third Party or used for any purpose other than as necessary to evaluate a potential Out-License), unless compelled to disclose by judicial or administrative process or by other requirements of Applicable Law, all confidential documents and information concerning a ROFN Candidate provided to Novartis pursuant to this Section 6.01 and Novartis shall be liable for any unauthorized disclosure or use of such confidential documents or information by its Affiliates, officers, directors, employees, accountants, counsel, consultants, advisors or agents.

Section 6.02. *Royalty Payments*. (a) For sales of any RNAi Products for which Novartis or any of its Affiliates, on the one hand, and Arrowhead or any of its Affiliates, on the other hand, do not enter into an Out-License pursuant to Section 6.01, Arrowhead shall pay Novartis royalty payments at the rates set forth in the tables below with respect to each RNAi Product during the applicable Royalty Period; provided that if there is no Valid Claim Covering such RNAi Product in a given country, or if a Generic Version of the RNAi Product has been approved for commercialization in such country, then in either case the royalty payments on such RNAi Product with respect to Net Sales generated in such country shall be reduced to an amount equal to [***]% of the royalty payments otherwise due on such Net Sales generated in such country during the applicable Royalty Period. Such royalty payments shall be paid in accordance with this Section 6.02(a). For purposes of this Section 6.02(a), a "**Generic Version**" of a RNAi Product shall mean (i) a generic or follow-on drug product marketed in the United States that has been approved by the FDA under 21 USC § 505(j) or 21 USC § 505(b)(2); (ii) a biosimilar or interchangeable biological product marketed in the United States that has been approved by FDA under 42 USC § 262(k); and (iii) a drug or biological product marketed outside the United States for which the equivalent foreign application for approval of a generic drug or biosimilar product has been approved by the applicable Regulatory Authority in the relevant foreign jurisdiction.

(1) RNAi Products (not including RNAi Products – Alnylam Only) directed to each Initial Target

Annual Net Sales ($US)	**Royalty Rates (% annual Net Sales)**	
	Each Category 1 Target	**Each Category 2 Target**
<=$[***]	[***]%	[***]%
>$[***] - $[***]	[***]%	[***]%
>$[***]	[***]%	[***]%

(2) RNAi Products (not including RNAi Products – Alnylam Only) directed to each New Target

Annual Net Sales ($US)	**Royalty Rate (% annual Net Sales)**
<=$[***]	[***]%
>$[***] - $[***]	[***]%
>$[***]	[***]%

(3) RNAi Products – Alnylam Only directed to each Initial Target or each New Target

Annual Net Sales ($US)	**Royalty Rate (% annual Net Sales)**
>=$[***]	[***]%

(b) Until the termination of all applicable Royalty Periods, Arrowhead shall, within [***] days after the end of each fiscal quarter, (i) deliver to Novartis a statement setting forth in reasonable detail its calculation of Net Sales for the fiscal quarter then ended with respect to each RNAi Product that has had a First Commercial Sale, and (ii) pay Novartis any royalty amounts, as determined in accordance with this Section 6.02, that are accrued and unpaid as of the end of the fiscal quarter then ended.

(c) The "**Royalty Period**" with respect to any RNAi Product in a given country shall begin on the First Commercial Sale of such RNAi Product in such country and shall continue until the later of (i) the expiration of the last-to-expire Valid Claim Covering such RNAi Product in such country and (ii) eleven (11) years after the First Commercial Sale of such RNAi Product in such country.

(d) Arrowhead shall be entitled to deduct from royalty payments payable hereunder for a given RNAi Product [***]% of all Required Third Party Payments paid by Arrowhead with respect to such RNAi Product during the applicable reporting period; *provided* that in no event shall a deduction under this Section 6.02(d) be taken for royalty payments made with respect to such RNAi Product to [***] and its Affiliates under the [***] Agreement; and *provided further* that in no event shall a deduction under this Section 6.02(d) reduce any royalty payment with respect to any such RNAi Product payable by Arrowhead hereunder by more than [***]%.

Section 6.03. *Milestone Payments*. (a) Subject to Section 6.03(b), with respect to each RNAi Product as to which Arrowhead or any of its Affiliates, on the one hand, and Novartis or any of its Affiliates, on the other hand, have not entered into an Out-License pursuant to Section 6.01, Arrowhead shall pay Novartis the following amounts in accordance with Section 6.03(b) following the achievement of the following development and annual sales milestones (it being agreed that the following annual sales milestones will be determined on a calendar year basis):

(1) RNAi Products directed to each Initial Target

(A) Development Milestones for each Initial Target

Milestone	**Payment ($US)**	
	Each Category 1 Target	**Each Category 2 Target**
Initiate Phase 2 Clinical Trial	$[***]	$[***]
Initiate Phase 3 Clinical Trial	$[***]	$[***]
Obtain Regulatory Approval in the United States	$[***]	$[***]
Obtain a second Regulatory Approval	$[***]	$[***]

(B) Sales Milestones for each Initial Target

Annual Net Sales ($US)	**Payment ($US)**	
	Each Category 1 Target	**Each Category 2 Target**
$[***]	$[***]	$[***]
$[***]	$[***]	$[***]
$[***]	$[***]	$[***]

(2) RNAi Products directed to each New Target

(A) Development Milestones for each New Target

Milestone	Payment ($US)
Initiate Phase 1 Clinical Trial	$[***]
Initiate Phase 2 Clinical Trial	$[***]
Initiate Phase 3 Clinical Trial	$[***]
Obtain Regulatory Approval in the United States	$[***]
Obtain a second Regulatory Approval	$[***]

(B) Sales Milestones for each New Target

Annual Net Sales ($US)	Payment ($US)
$[***]	$[***]
$[***]	$[***]
$[***]	$[***]

(b) Within [***] days after the achievement of any of the development milestones set forth in Section 6.03(a), Arrowhead shall notify Novartis thereof and shall pay the amounts due hereunder on. Within [***] days after the end of the first calendar quarter in which each sales milestone set forth in Section 6.03(a) is achieved, Arrowhead shall notify Novartis thereof and shall pay the amount due for such milestone hereunder on an RNAi Product-by-RNAi Product basis.

Section 6.04. *Diligence; Development and Commercialization Reports.*

(a) *Diligence*. Arrowhead shall use Commercially Reasonable Efforts: (i) to research and develop RNAi Products and obtain Regulatory Approvals for such RNAi Products in the RNAi Field; and (ii) to commercialize each RNAi Product in each country in which it receives Regulatory Approval.

(b) *Development and Commercialization Reports.* Arrowhead shall keep Novartis reasonably informed as to the progress of its and its Affiliates' development and commercialization activities under this Agreement. Arrowhead shall provide Novartis with a written report within [***] ([***]) days after the end of each calendar year during the term of this Agreement which summaries the development and commercialization activities performed in the proceeding [***] ([***]) months, including a summary of the results of such development and commercialization activities, provided that Arrowhead shall provide written updates during such calendar year following a material change to such development and commercialization activities described in such report. Information contained in the reports as described in this Section 6.04(b) shall be considered to be Confidential Information of Arrowhead and may only be used for the purpose of confirming compliance with Section 6.04(a). Arrowhead shall promptly respond to Novartis' reasonable questions or requests for additional clarification relating to such development and commercialization activities.

Section 6.05. *Financial Records and Audit; Late Payments*.

(a) Arrowhead shall, and shall cause its Affiliates and sublicensees to, maintain complete and accurate records in sufficient detail to permit Novartis to confirm the royalty and milestone payments payable under this Agreement and to verify the achievement of milestone events under this Agreement. Upon reasonable prior notice, such records shall be open during regular business hours at such place or places where such records are customarily kept for a period of three (3) years following the calendar year to which they pertain. Such inspection right shall not be exercised more often than once in any calendar year and not more frequently than once with respect to records covering any specific period of time, by an internationally recognized and independent certified public accountant selected by Novartis and reasonably acceptable to Arrowhead for the sole purpose of verifying for Novartis the accuracy of the financial reports furnished by Arrowhead, its Affiliates and sublicensees pursuant to this Agreement or of any payments made, or required to be made, by or to Novartis pursuant to this Agreement. Any such auditor shall not disclose Arrowhead's confidential information to Novartis, except to the extent such disclosure is necessary to verify the accuracy of the financial reports furnished by Arrowhead or the amount of payments to or by Arrowhead, its Affiliates and sublicensees under this Agreement. In the event that the final result of the inspection reveals an undisputed underpayment or overpayment, the underpaid or overpaid amount shall be settled within thirty (30) days after the Parties' receipt of such final results. Novartis shall pay for such inspections, provided, that if an underpayment of more than five percent (5%) of the amount owed hereunder for the applicable period is discovered, the fees and expenses for such inspection/audit shall be paid by Arrowhead.

(b) Arrowhead shall pay Novartis interest on any late payments under this Agreement not made within fifteen (15) days of the due date at a rate per annum equal to the lesser of the three (3) month LIBOR rate for United States Dollars plus one percent (1.0%) or the maximum applicable legal rate calculated on the total number of days payment is late.

ARTICLE 7
SURVIVAL; INDEMNIFICATION

Section 7.01. *Survival* (a). The representations and warranties of the Parties contained in this Agreement shall survive the Closing until the date that is eighteen months following the Effective Date, at which time they shall terminate (and no claims shall be made for indemnification under Section 7.02 for Warranty Breaches thereafter); provided that the representations and warranties contained in Section 3.06(a), 3.06(c), 3.09, 4.6, and 4.7 shall survive indefinitely or until the latest date permitted by law. The covenants and agreements of the Parties contained in this Agreement or in any certificate or other writing delivered pursuant hereto or in connection herewith shall survive the Closing indefinitely or for the shorter period explicitly specified therein, except that for such covenants and agreements that survive for such shorter period, breaches thereof shall survive indefinitely or until the latest date permitted by Applicable Law. Notwithstanding the preceding sentences, any breach of representation, warranty, covenant or agreement in respect of which indemnity may be sought under this Agreement shall survive the time at which it would otherwise terminate pursuant to the preceding sentences if notice of the inaccuracy or breach thereof giving rise to such right of indemnity shall have been given to the Party against whom such indemnity may be sought prior to such time.

Section 7.02. *Indemnification; Certain Limitations*. (a) Effective at and after the Closing, Novartis hereby indemnifies Arrowhead and its Affiliates against and agrees to hold each of them harmless from any and all damage, loss and expense (including reasonable expenses of investigation and reasonable attorneys' fees and expenses in connection with any action, suit or proceeding whether involving a Third Party claim or a claim solely between the Parties) ("**Damages**") actually suffered by Arrowhead or any of its Affiliates arising out of any misrepresentation or breach of warranty (each such misrepresentation and breach of warranty a "**Warranty Breach**") or breach of covenant or agreement made or to be performed by Novartis pursuant to this Agreement.

(b) Effective at and after the Closing, Arrowhead hereby indemnifies Novartis and its Affiliates against and agrees to hold each of them harmless from any and all Damages actually suffered by Novartis or any of its Affiliates arising out of (i) any Warranty Breach or breach of covenant or agreement made or to be performed by Arrowhead pursuant to this Agreement, (ii) any matter relating to actions taken or omitted to be taken by Arrowhead prior to the Effective Date, except to the extent any such matter is indemnifiable by Novartis pursuant to Section 7.02(a), (iii) any matter relating to actions taken or omitted to be taken by Arrowhead or any of its Affiliates on or after the Effective Date or (iv) any liability or obligation relating to or arising out of an Assigned RNAi IP (other than any matter relating to an Assigned RNAi IP that is indemnifiable by Novartis pursuant to Section 7.02(a)).

(c) *Certain Limitations*. The indemnification provided for in Section 7.02(a) shall be subject to the following limitations:

(i) Novartis shall not be liable to Arrowhead for indemnification under Section 7.02(a) until the aggregate amount of all Damages in respect of indemnification under Section 7.02(a) exceeds $[***] (the "**Deductible**"), in which event Novartis shall only be required to pay or be liable for Damages in excess of the Deductible. With respect to any claim as to which Arrowhead may be entitled to indemnification under Section 7.02(a), Novartis shall not be liable for any individual or series of related Damages that do not exceed $[***] (which Damages shall not be counted toward the Deductible).

(ii) The aggregate amount of all Damages for which Novartis shall be liable pursuant to Section 7.02(a) shall not exceed the lesser of: (A) the sum of the cash payments made by Arrowhead to Novartis under this Agreement as of the date that Damages are awarded to Arrowhead; or (B) $[***].

(iii) Novartis shall not be liable under this Article 7 for any Damages based upon or arising out of any inaccuracy in or breach of any of the representations or warranties of Novartis contained in this Agreement if Arrowhead had knowledge of such inaccuracy or breach prior to the Closing.

Section 7.03. *Third Party Claim Procedures*. (a) The Party seeking indemnification under Section 7.02 (the "**Indemnified Party**") agrees to give prompt notice to the Party against whom indemnity is sought (the "**Indemnifying Party**") of the assertion of any claim or the commencement of any suit, action or proceeding by any Third Party (each, a "**Third Party Claim**") in respect of which indemnity may be sought under Section 7.02. Such notice shall set forth in reasonable detail such Third Party Claim and the basis for indemnification (taking into account the information then available to the Indemnified Party). The failure to so notify the Indemnifying Party shall not relieve the Indemnifying Party of its obligations hereunder, except to the extent such failure shall have adversely prejudiced the Indemnifying Party. Thereafter, the Indemnified Party shall deliver to the Indemnifying Party, as promptly as reasonably practicable following the Indemnified Party's receipt thereof, copies of all written notices and documents (including any court papers) received by the Indemnified Party relating to the Third Party Claim and the Indemnified Party shall provide the Indemnifying Party with such other information with respect to any such Third Party Claim reasonably requested by the Indemnifying Party.

(b) The Indemnifying Party shall be entitled to participate in the defense of any Third Party Claim and may, upon written notice to the Indemnified Party, assume control of the defense, appeal and settlement of such Third Party Claim and appoint lead counsel for such defense, in each case at its sole cost and expense; *provided*, *however*, that the Indemnifying Party shall not be entitled to (i) assume the defense, appeal or settlement of any Third Party Claim if (A) the Third Party Claim relates to or arises in connection with any criminal proceeding, action, indictment, allegation or investigation or (B) the Third Party Claim seeks any injunction or equitable relief against the Indemnified Party or (ii) maintain control of the defense, appeal or settlement of any Third Party Claim if the Indemnifying Party has failed or is failing to defend in good faith the Third Party Claim and the Indemnified Party has provided prior written notice and a reasonable opportunity for the Indemnifying Party to cure such failure.

(c) If the Indemnifying Party is entitled to do so and has assumed the defense, appeal or settlement proceedings of the Third Party Claim in accordance herewith, the Indemnified Party may retain separate counsel at its sole cost and expense and participate in the defense, appeal or settlement proceedings of the Third Party Claim; *provided* that if the Indemnified Party shall reasonably conclude that (i) there is a material conflict of interest between the Indemnifying Party and the Indemnified Party in the conduct of the defense of such claim or (ii) there are specific defenses or claims available to the Indemnified Party which are different from or additional to those available to the Indemnifying Party and which could be materially adverse to the Indemnifying Party, then the reasonable fees and disbursements of one counsel for the Indemnified Party shall be paid by the Indemnifying Party; *provided* that the Indemnifying Party shall not be required to pay for more than one counsel for all Indemnified Parties in connection with any Third Party Claim. The Indemnified Party may take any actions reasonably necessary to defend such Third Party Claim prior to the date the Indemnifying Party assumes control of the defense of the Third Party Claim and shall be entitled to all reasonable fees and expenses of counsel incurred in connection therewith prior to such date.

(d) If the Indemnifying Party is entitled to do so and has assumed the defense, appeal or settlement proceedings of the Third Party Claim in accordance herewith, the Indemnifying Party shall not enter into any settlement with respect to the Third Party Claim without the prior written consent of the Indemnified Party (which consent shall not be unreasonably withheld, conditioned or delayed); *provided* that consent of the Indemnified Party shall not be required for any such settlement if (i) the sole relief provided is monetary damages that are paid in full by the Indemnifying Party, (ii) such settlement does not permit any order, injunction or other equitable relief to be entered, directly or indirectly, against the Indemnified Party and (iii) such settlement includes an unconditional release of such Indemnified Person from all liability on claims that are the subject matter of such Third Party Claim and does not include any statement as to or any admission of fault, culpability or a failure to act by or on behalf of any Indemnified Person. Whether or not the Indemnifying Party has assumed the defense, appeal or settlement proceedings, the Indemnifying Party shall not be obligated to indemnify any Indemnified Party hereunder for any settlement entered into or any judgment that was consented to without the Indemnifying Party’s prior written consent (which consent shall not be unreasonably withheld, conditioned or delayed).

(e) Each Party shall cooperate, and cause its Affiliates to cooperate, in the defense or prosecution of any Third Party Claim and shall furnish or cause to be furnished such records, information and testimony, and attend such conferences, discovery proceedings, hearings, trials or appeals, as may be reasonably requested in connection therewith.

Section 7.04. *Direct Claim Procedures*. In the event an Indemnified Party has a claim for indemnity under Section 7.02 against an Indemnifying Party that does not involve a Third Party Claim, the Indemnified Party agrees to give prompt notice in writing of such claim to the Indemnifying Party. The notice shall set forth (i) that such Indemnified Party has paid, incurred or reasonably anticipates incurring Damages, for which such Indemnified Party is entitled to recovery under Section 7.02, (ii) a written statement describing the nature of the claim and the basis therefor, (iii) the amount of such Damages incurred or that such Indemnified Party reasonably estimates in good faith is likely to be incurred in connection with such claim and (iv) if applicable, the instructions for payment to such Indemnified Party (taking into account, for purposes of the foregoing clauses, the information then available to the Indemnified Party). The failure to so notify the Indemnifying Party shall not relieve the Indemnifying Party of its obligations hereunder, except to the extent such failure shall have actually prejudiced the Indemnifying Party. If the Indemnifying Party disputes its indemnity obligation for any Damages with respect to such claim, the Parties shall proceed in good faith to negotiate a resolution of such dispute and, if not resolved through negotiations, such dispute shall be resolved by litigation in an appropriate court of jurisdiction determined pursuant to Section 8.06.

Section 7.05. *Calculation of Damages*. (a) The amount of any Damages payable under Section 7.02 by the Indemnifying Party shall be net of any amounts recovered or recoverable by the Indemnified Party under applicable insurance policies or from any other Person alleged to be responsible therefor. If the Indemnified Party receives any amounts under applicable insurance policies, or from any other Person alleged to be responsible for any Damages, subsequent to an indemnification payment by the Indemnifying Party, then such Indemnified Party shall promptly reimburse the Indemnifying Party for any payment made or expense incurred by such Indemnifying Party in connection with providing such indemnification payment up to the amount received by the Indemnified Party, net of any expenses incurred by such Indemnified Party in collecting such amount.

(b) For the avoidance of doubt, the Indemnifying Party shall not be liable under Section 7.02 for (i) special, punitive, indirect or consequential Damages, (ii) any Damages to the extent not the probable and reasonably foreseeable result of any breach by the Indemnifying Party of a representation and warranty or covenant contained in this Agreement or (iii) Damages for lost profits; *provided* that this Section 7.05(b) shall not apply to any Damages that are recovered by Third Parties in connection with a Third Party Claim. Notwithstanding anything in this Agreement to the contrary, no Damages shall be determined or increased based on any multiple of any financial measure (including earnings, sales or other benchmarks) that might have been used by Arrowhead in the valuation of the Novartis RNAi Business. No Indemnified Party shall be entitled to recover Damages or otherwise be indemnified hereunder (or receive other payment, reimbursement or restitution) more than once in respect of any one given liability, loss, cost or shortfall, regardless of whether more than one claim for Damages arises in respect of it.

(c) Each Indemnified Party must mitigate in accordance with Applicable Law any loss for which such Indemnified Party seeks indemnification under this Agreement. If such Indemnified Party mitigates its loss after the Indemnifying Party has paid the Indemnified Party under any indemnification provision of this Agreement in respect of that loss, the Indemnified Party must notify the Indemnifying Party and pay to the Indemnifying Party the extent of the value of the benefit to the Indemnified Party of that mitigation (less the Indemnified Party's reasonable costs of mitigation) within two Business Days after the benefit is received.

(d) Each Indemnified Party shall use reasonable efforts to collect any amounts available under insurance coverage, or from any other Person alleged to be responsible, for any Damages payable under Section 7.02.

Section 7.06. *Assignment of Claims*. If the Indemnified Party receives any payment from an Indemnifying Party in respect of any Damages pursuant to Section 7.02 and the Indemnified Party could have recovered all or a part of such Damages from a Third Party (a "**Potential Contributor**") based on the underlying Claim asserted against the Indemnifying Party, the Indemnified Party shall assign such of its rights to proceed against the Potential Contributor as are necessary to permit the Indemnifying Party to recover from the Potential Contributor the amount of such payment.

Section 7.07. *Exclusivity*. Except as specifically set forth in this Agreement, effective as of the Closing (i) Arrowhead waives, any rights and claims Arrowhead or any of its Affiliates may have against Novartis or any of its Affiliates, whether in law or in equity, relating to the Acquired RNAi Assets or the transactions contemplated hereby and (ii) Novartis waives any such rights and claims Novartis and its Affiliates may have against Arrowhead or any of its Affiliates. The rights and claims waived by Arrowhead and Novartis and their respective Affiliates include claims for breach of contract, breach of representation or warranty, negligent misrepresentation and all other claims for breach of duty. Subject to Section 8.12, after the Closing, Section 7.02 will provide the exclusive remedy for any misrepresentation or breach of warranty, covenant or other agreement or other claim arising out of this Agreement or the transactions contemplated hereby.

ARTICLE 8
MISCELLANEOUS

Section 8.01. *Notices*. All notices, requests and other communications to any Party shall be in writing (including facsimile transmission and electronic mail ("**e-mail**") transmission, so long as a receipt of such e-mail is requested and received) and shall be given,

if to Arrowhead, to:

Arrowhead Research Corporation
225 South Lake Avenue, Suite 300
Pasadena, California 91101
Attention: Christopher Anzalone, Ph.D.
Facsimile No.: (626) 304-3401
E-mail: canzalone@arrowres.com

with a copy to:

Gibson, Dunn & Crutcher LLP
555 Mission Street, Suite 3000
San Francisco, California 94105
Attention: Ryan A. Murr
Facsimile No.: (415) 374-8430
E-mail: rmurr@gibsondunn.com

if to Novartis, to:

Novartis Institutes for BioMedical Research, Inc.
250 Massachusetts Avenue
Cambridge, Massachusetts 02139
Attention: General Counsel
Facsimile No.: (617) 871-5786

or such other address or facsimile number as such Party may hereafter specify for the purpose by notice to the other Party. All such notices, requests and other communications shall be deemed received on the date of receipt by the recipient thereof if received prior to 5 p.m. in the place of receipt and such day is a Business Day in the place of receipt. Otherwise, any such notice, request or communication shall be deemed not to have been received until the next succeeding Business Day in the place of receipt.

Section 8.02. *Amendments and Waivers*. (a) Any provision of this Agreement may be amended or waived if, but only if, such amendment or waiver is in writing and is signed, in the case of an amendment, by each Party, or in the case of a waiver, by the Party against whom the waiver is to be effective.

(b) No failure or delay by any Party in exercising any right, power or privilege hereunder shall operate as a waiver thereof nor shall any single or partial exercise thereof preclude any other or further exercise thereof or the exercise of any other right, power or privilege. Except as set forth in Section 8.07, the rights and remedies herein provided shall be cumulative and not exclusive of any rights or remedies provided by law.

Section 8.03. *Expenses*. Except as otherwise provided herein, all costs and expenses incurred in connection with this Agreement shall be paid by the Party incurring such cost or expense.

Section 8.04. *Successors and Assigns*. The provisions of this Agreement shall be binding upon and inure to the benefit of the Parties and their respective successors and assigns; provided that no Party may assign, delegate or otherwise transfer any of its rights or obligations under this Agreement without the consent of the other Party hereto, except that (i) Novartis may transfer or assign its rights and obligations under this Agreement in whole or from time to time in part to one or more of its Affiliates and (ii) either Party may transfer or assign its rights and obligations under this Agreement, in whole or from time to time in part, to any successor in interest by way of a Change of Control; provided that (A) in the case of clause (ii), such successor shall have executed and delivered to the other Party, an acknowledgement in writing that effective as of such transfer or assignment, such successor shall be bound by this Agreement to the identical extent applicable the assignor or transferor, as applicable, and (B) in the case of clauses (i) and (ii), no such transfer or assignment shall relieve the assigning or transferring Party of its obligations hereunder or enlarge, alter or change any obligation of any other Party. If a Change of Control occurs with respect to Arrowhead, Arrowhead shall cause each successor in interest and acquiring Person (to the extent such Person would not, by the nature of the transaction, become so bound by operation of law) to execute and deliver to Novartis an acknowledgement in writing that such Person shall be bound by the terms of Article 6 to the identical extent applicable to Arrowhead.

Section 8.05. *Governing Law*. This Agreement shall be governed by and construed in accordance with the law of the State of Delaware, without regard to the conflicts of law rules of such state.

Section 8.06. *Jurisdiction*. The Parties agree that any suit, action or proceeding seeking to enforce any provision of, or based on any matter arising out of or in connection with, this Agreement or the transactions contemplated hereby shall be brought in the United States District Court for the District of Delaware or the Court of Chancery of the State of Delaware, so long as one of such courts shall have subject matter jurisdiction over such suit, action or proceeding, and that any cause of action arising out of this Agreement shall be deemed to have arisen from a transaction of business in the State of Delaware, and each of the Parties hereby irrevocably consents to the jurisdiction of such courts (and of the appropriate appellate courts therefrom) in any such suit, action or proceeding and irrevocably waives, to the fullest extent permitted by Applicable Law, any objection that it may now or hereafter have to the laying of the venue of any such suit, action or proceeding in any such court or that any such suit, action or proceeding brought in any such court has been brought in an inconvenient forum. Process in any such suit, action or proceeding may be served on any Party anywhere in the world, whether within or without the jurisdiction of any such court. Without limiting the foregoing, each Party agrees that service of process on such Party as provided in Section 8.01 shall be deemed effective service of process on such Party.

Section 8.07. *WAIVER OF JURY TRIAL*. EACH OF THE PARTIES HEREBY IRREVOCABLY WAIVES ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATED TO THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY.

Section 8.08. *Counterparts; Effectiveness; Third Party Beneficiaries*. This Agreement may be signed in any number of counterparts, each of which shall be an original, with the same effect as if the signatures thereto and hereto were upon the same instrument. This Agreement shall become effective when each Party shall have received a counterpart hereof signed by the other Party hereto. Until and unless each Party has received a counterpart hereof signed by the other Party hereto, this Agreement shall have no effect and no Party shall have any right or obligation hereunder (whether by virtue of any other oral or written agreement or other communication). No provision of this Agreement is intended to confer any rights, benefits, remedies, obligations, or liabilities hereunder upon any Person other than the Parties and their respective successors and assigns.

Section 8.09. *Entire Agreement*. This Agreement and the other Transaction Documents constitute the entire agreement between the Parties with respect to the subject matter of this Agreement and supersede all prior agreements and understandings, both oral and written, between the Parties with respect to the subject matter of this Agreement and each other Transaction Document.

Section 8.10. *Severability*. If any term, provision, covenant or restriction of this Agreement is held by a court of competent jurisdiction or other Governmental Authority to be invalid, void or unenforceable, the remainder of the terms, provisions, covenants and restrictions of this Agreement shall remain in full force and effect and shall in no way be affected, impaired or invalidated so long as the economic or legal substance of the transactions contemplated hereby is not affected in any manner materially adverse to any Party. Upon such a determination, the Parties shall negotiate in good faith to modify this Agreement so as to effect the original intent of the Parties as closely as possible in an acceptable manner in order that the transactions contemplated hereby be consummated as originally contemplated to the fullest extent possible.

Section 8.11. *Disclosure Schedules; Arrowhead SEC Documents*. (a) Novartis and Arrowhead have set forth information on the Novartis Disclosure Schedule and the Arrowhead Disclosure Schedule, respectively, in a section thereof that corresponds to the section of this Agreement to which it relates. A matter set forth in one section of a Schedule need not be set forth in any other section so long as its relevance to such other section of the Schedule or section of the Agreement is reasonably apparent on the face of the information disclosed therein to the Person to which such disclosure is being made. The Parties acknowledge and agree that (i) the Schedules to this Agreement may include certain items and information solely for informational purposes for the convenience of the other Party and (ii) the disclosure by either Party of any matter in the Schedules shall not be deemed to constitute an acknowledgment by such Party that the matter is required to be disclosed by the terms of this Agreement or that the matter is material.

(b) The Parties agree that any information contained in any part of any Arrowhead SEC Document shall be deemed an exception to (or a disclosure for purposes of) a representation and warranty of Arrowhead only if the relevance of that information as an exception to (or a disclosure for purposes of) such representation and warranty is reasonably apparent on the face of the information disclosed therein to the Person to which such disclosure is being made; *provided* that in no event shall any information contained in any part of any Arrowhead SEC Document entitled “Risk Factors” (or words of similar import) or containing a description or explanation of “Forward-Looking Statements” be deemed to be an exception to (or a disclosure for purposes of) any representations and warranties of Arrowhead contained in this Agreement.

Section 8.12. *Specific Performance*. The Parties agree that irreparable damage would occur if any provision of this Agreement were not performed in accordance with the terms hereof and that the Parties shall be entitled to an injunction or injunctions to prevent breaches of this Agreement or to enforce specifically the performance of the terms and provisions hereof in the United States District Court for the District of Delaware or the Court of Chancery of the State of Delaware, in addition to any other remedy to which they are entitled at law or in equity.

Section 8.13. *Waiver of Conflicts Regarding Representation; Non-assertion of Attorney-Client Privilege*. (a) Arrowhead waives and will not assert any conflict of interest arising out of or relating to the representation, after the Closing (the "**Post-Closing Representation**"), of Novartis, any Affiliate of Novartis or any stockholder, officer, employee or director of Novartis (any such Person, a "**Designated Person**") in any matter involving the Transaction Documents or any other agreements or transactions contemplated hereby or thereby, by any legal counsel currently representing Novartis or any Affiliate of Novartis in connection with the Transaction Documents or any other agreements or transactions contemplated hereby or thereby (the "**Current Representation**").

(b) Arrowhead waives and will not assert any attorney-client privilege with respect to any communication between any legal counsel and any Designated Person occurring during the Current Representation in connection with any Post-Closing Representation, including in connection with a dispute with Arrowhead, and following the Closing, with Novartis, it being the intention of the Parties that all such rights to such attorney-client privilege and to control such attorney-client privilege shall be retained by Novartis; *provided* that the foregoing waiver and acknowledgement of retention shall not extend to any communication not involving the Transaction Documents or any other agreements or transactions contemplated hereby or thereby, or to communications with any Person other than the Designated Persons.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed by their respective authorized officers as of the day and year first above written.

ARROWHEAD RESEARCH CORPORATION

By: /s/ Christopher Anzalone
Name: Christopher Anzalone
Title: Chief Executive Officer

NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH, INC.

By: /s/ Scott A. Brown
Name: Scott A. Brown
Title: VP, General Counsel

Exhibit 31.1

CERTIFICATION PURSUANT SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Christopher Anzalone, Chief Executive Officer of Arrowhead Research Corporation, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arrowhead Research Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 11, 2015

/s/ CHRISTOPHER ANZALONE

Christopher Anzalone
Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Kenneth A. Myszkowski, Chief Financial Officer of Arrowhead Research Corporation, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Arrowhead Research Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 11, 2015

/s/ Kenneth A. Myszkowski

Kenneth A. Myszkowski,
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, Christopher Anzalone, Chief Executive Officer of Arrowhead Research Corporation (the "Company"), certify, pursuant to Rule 13(a)-14(b) or Rule 15(d)-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350, that (i) the Quarterly Report on Form 10-Q of the Company for the quarterly period ended March 31, 2015, fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, and (ii) the information contained in such Quarterly Report on Form 10-Q fairly presents in all material respects the financial condition and results of operations of the Company.

Date: May 11, 2015

/s/ CHRISTOPHER ANZALONE

Christopher Anzalone
Chief Executive Officer

A signed original of these written statements required by 18 U.S.C. Section 1350 has been provided to Arrowhead Research Corporation and will be retained by Arrowhead Research Corporation and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 32.2

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, Kenneth A. Myszkowski, Chief Financial Officer of Arrowhead Research Corporation (the "Company"), certify, pursuant to Rule 13(a)-14(b) or Rule 15(d)-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350, that (i) the Quarterly Report on Form 10-Q of the Company for the quarterly period ended March 31, 2015, fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, and (ii) the information contained in such Quarterly Report on Form 10-Q fairly presents in all material respects the financial condition and results of operations of the Company.

Date: May 11, 2015

/s/ Kenneth A. Myszkowski

Kenneth A. Myszkowski
Chief Financial Officer

A signed original of these written statements required by 18 U.S.C. Section 1350 has been provided to Arrowhead Research Corporation and will be retained by Arrowhead Research Corporation and furnished to the Securities and Exchange Commission or its staff upon request.